

# SHARP® SERVICE MANUAL

SY308R7A55EHW



R-7A55(W)

## GRILL AND CONVECTION MICROWAVE OVEN

### MODELS **R-7A55(W)** **R-7A55(B)** **R-7E45(W)** **R-7E45(B)**

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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**SHARP CORPORATION**

## **CAUTION MICROWAVE RADIATION**

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured.

Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

## **VARNING MICKROVAGSSTRÅLING**

Personal får inte utsättas för mikrovågsenergi som kan stråla från magnetronen eller andre mikrovågsgenererande anordningar om dessa är felanslutna eller används på fel sätt. Alla in- och utgångsanslutningar för mikrovågor, vågledare, flänsar och packningar måste vara fast anslutna.

Mikrovågsgeneratoren får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i en öppen vågledare eller antenn när mikrovågsgeneratoren är påkopplad eller laddad.

## **VAROITUS MIKROAALTOSÄTELYÄ**

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin. Kaikkien mikroaaltoliitännöiden sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivistysten tulee olla varmistettuja.

Mikroaaltouunin ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

## **ADVARSEL MIKROBØLGESTRÅLING**

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn- og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.

Aldri bruk apparatet med mindre en mikrobølge-absorberende last er plassert i ovnsrommet.

Aldri se direkte inn i en åpen bølgeleder eller antenne mens apparatet er strømførende.

## **ADVARSEL MIKROBØLGEBESTRÅLING**

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.

Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

# SERVICE MANUAL

## SHARP

### GRILL AND CONVECTION MICROWAVE OVEN

R-7A55(W)/ R-7A55(B)/R-7E45(W)/R-7E45(B)

#### GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

#### WARNING

Note:	The parts marked "*" are used in voltage more than 250V. (Parts List)
Anm:	Delar märket med "*" har en spänning överstigande 250V.
Huom:	Huolto-ohjeeseen merkitty "tähdellä" osat joissa jännite on yli 250 V.
Bemerk:	Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
Bemærk:	"Dele mærket med stjerne benyttes med højere spænding end 250 volt.

#### WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door latches and hinges are not defective.
- (C) The door is not deformed or warped.
- (D) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

Note: All the parts marked "Δ" on the parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

**SHARP CORPORATION**

**OSAKA, JAPAN**

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT  
COMPONENTS

SERVICING AND  
TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL

COMPONENT  
REPLACEMENT AND  
ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT






TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST

## PRODUCT DESCRIPTION

### SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	220-230 Volts / 50 Hertz / Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1.6 kW Approx. 7.5A
	Dual cooking (Microwave and Grill) 2.8kW Approx. 12.8A
	(Microwave and Convection) 2.9kW Approx. 13.5A
	Convection cooking 1.5kW Approx. 6.1A
	Grill cooking Max. 2.55kW Approx. 11.3A
Power Output	1000 watts nominal of RF microwave energy (measured by method of IEC 705) Operating frequency 2450 MHz
Convection heating element Power Output	1.3kW
Grill heating element Power Output	1.2kW (600W x 2)
Case Dimensions	Width 520 mm Height 305 mm (including foot) Depth 478 mm
Cooking Cavity Dimensions	Width 342 mm Height 195 mm Depth 357 mm
Turntable diameter	325mm
Control Complement	Touch Control System Microwave Cooking Control Repetition Rate;  HIGH ..... Full power throughout the cooking time  MEDIUM HIGH ..... approx. 70% of FULL Power  MEDIUM ..... approx. 50% of FULL Power  MEDIUM LOW ..... approx. 30% of FULL Power  LOW ..... approx. 10% of FULL Power POTATO keys (R-7A55 only) INSTANT ACTION keys (R-7A55 only) LESS(▼)/MORE(▲) (R-7A55 only) DUAL COOK, GRILL, MICROWAVE, CONVECTION MINUTE TIMER/HOLD CLOCK SETTING, STOP MINUTE PLUS/START TIME KEY (10 MIN., 1MIN., 10 SEC.)
Set Weight	Approx. 23 kg

### GENERAL IMPORTANT INFORMATION

#### WARNING

#### THIS APPLIANCE MUST BE EARTHED

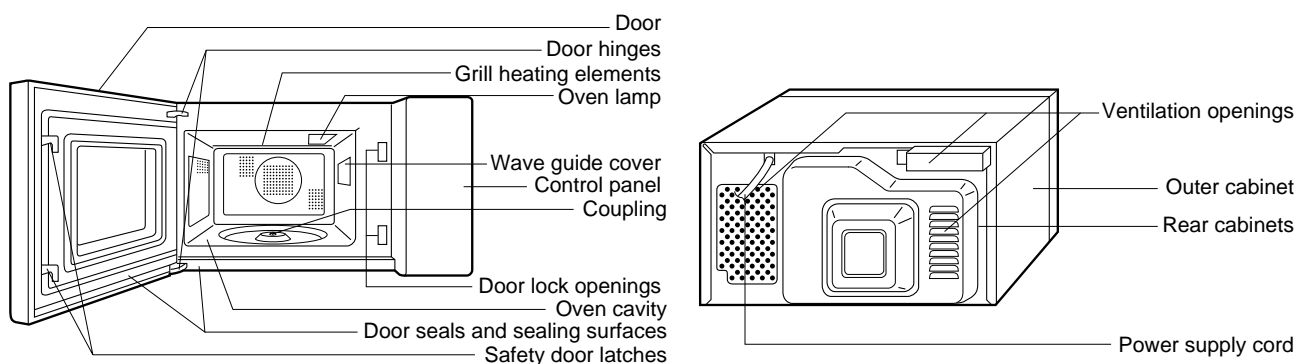
#### IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

## APPEARANCE VIEW

### OVEN



### CONTROL PANEL

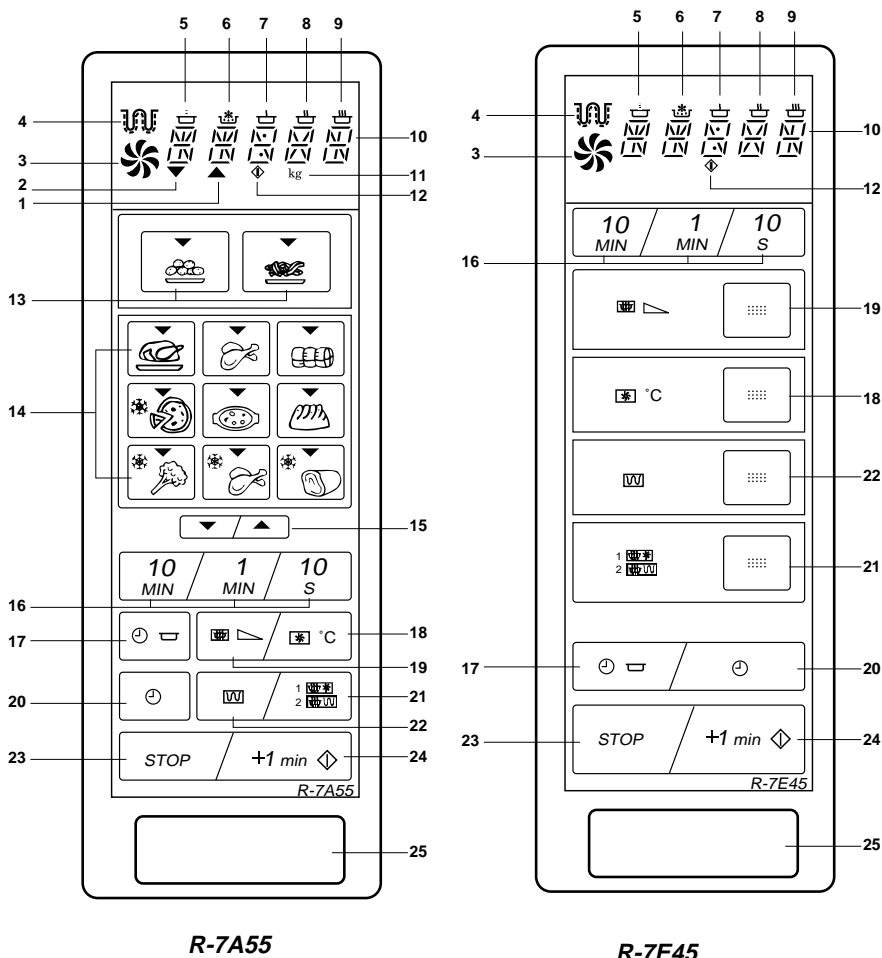
#### DISPLAY AND INDICATORS

Check indicator after the oven parts to confirm the oven is operating as desired.

1. MORE indicator
  2. LESS indicator
  3. CONVECTION indicator
  4. GRILL indicator
  5. LOW
  6. MEDIUM LOW
  7. MEDIUM
  8. MEDIUM HIGH
  9. HIGH
  10. Digital display
  11. Units of weight indicator
  12. Cook indicator
- This indicator shows cooking in progress.

#### OPERATING KEY

13. POTATO keys
14. INSTANT ACTION keys
15. MORE(▲)/LESS(▼) keys
16. Time keys
17. MINUTE TIMER/HOLD key
18. CONVECTION key
19. MICROWAVE key
20. CLOCK SETTING key
21. DUAL COOK key
22. GRILL key
23. STOP key
24. MINUTE PLUS/START key
25. Door open button



## OPERATION SEQUENCE

### OFF CONDITION

Closing the oven door activates all door interlock switches (1st. latch switch, 2nd. latch switch and stop switch).

#### IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch SW4 must be open and the contacts (COM-NO) must be closed. When the microwave oven is plugged in a wall outlet (220 - 230V / 50Hz), 220 - 230 volts A.C. is supplied to the point H1 + H3 in the control unit.

Figure O-1 on page 32

1. The display flashes "88:88"
  2. To set any programmes or set the clock, you must first touch the STOP key.
  3. " : " appears in display.
- NOTE: When the oven door is opened, the oven lamp comes on at this time.

### MICROWAVE COOKING CONDITION

#### HIGH COOKING

Enter a desired cooking time with the touching Time key and start the oven with touching START key.

Function sequence Figure O-2 on page 32

CONNECTED COMPONENTS	RELAY
Oven lamp, Fan motor, Turntable motor	RY1
High voltage transformer	RY1 + RY2
Fan motor	RY6

1. 220-230 volts A.C. is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1 + RY2 + RY6 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	Condition
		During Cooking	Oven Door Open(No cooking)
1st latch Switch	COM-NO	Closed	Opened
Monitor Switch	COM-NO	Closed	Opened
Monitor Switch	COM-NC	Opened	Closed
2nd latch switch	COM-NO	Closed	Opened
Stop switch	COM-NO	Closed	Opened

The circuit to the high voltage transformer, is cut off when the contact of relay RY2 contacts COM-NO of the 1st latch switch, and monitor switch SW4 are made open. The circuit to the fan motor is cut off when the relay RY6 is made open. The circuit to the turntable motor is cut off when the contacts

COM-NO of the 2nd latch switch are made open. The relay RY2 and RY6 are made open when the door is opened. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stay closed. Shown in the display is remaining time.

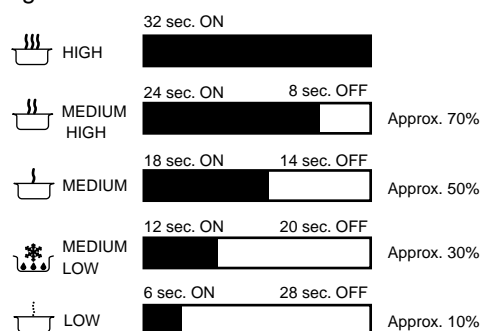
#### 6. MONITOR SWITCH CIRCUIT

The monitor switch SW4 is mechanically controlled by the oven door, and monitors the operation of the 1st latch switch SW1.

- 6-1. When the oven door is opened during or after the cycle of a cooking program, the 1st latch switch SW1 and stop switch SW3 must open their contacts (COM-NO) first. After that the contacts (COM-NC) of the monitor switch SW4 can be closed and the contacts (COM-NO) of monitor switch SW4 are made open, and the contacts (COM-NO) of the 2nd latch switch SW2 can be opened.
- 6-2. When the oven door is closed. The contacts (COM-NC) of the monitor switch SW4 must be opened and the contacts (COM-NO) of monitor switch SW4 must be closed, and the contacts (COM-NO) of the 2nd latch switch SW2 must be closed. After that the contacts of the 1st latch switch SW1 and the stop switch SW3 are made closed.
- 6-3. When the oven door is opened and the contacts of the 1st latch switch SW1 remain closed, the fuse F2 F6.3A will blow. Because the relay RY1 and monitor switch SW4 are closed and a short circuit is caused.

### MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the 220 - 230 volts A.C. power is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.



Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

### CONVECTION COOKING CONDITION

#### PREHEATING CONDITION (Figure O-3)

Program desired convection temperature by touching CONVECTION key. When the START key is touched, the following operations occur:

1. The coil of shut-off relays RY1, RY4 and RY6 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.

2. The coil of shut-off relay RY3 is energized by the control unit and the main supply voltage is added to the convection heating element.
3. When the oven temperature reaches the selected preheat temperature, the following operations occur:
  - 3-1. The shut-off relay RY3 is de-energized by the control unit temperature circuit and thermistor, opening the circuit to the convection heating element.
  - 3-2. The oven will continue to function for 15 minutes, turning the convection heating elements on and off, as needed to maintain the selected preheat temperature. The oven will shut-down completely after 15 minutes.

### **CONVECTION COOKING CONDITION (Figure O-3)**

When the preheat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. Program desired cooking time and convection temperature by touching the CONVECTION key. When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. Relay RY3 is energized (If the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the convection heating element to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor are de-energized. At the end of convection cycle, if the cavity air temperature is above 104°C, the circuit to RY6 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until temperature drops below 104°C, at that time the relay will be de-energized, turning off the fan motor.

### **GRILL COOKING CONDITION (Figure O-4)**

In this condition the food is cooked by grill heating element energy. And at the initial period (approximately 10 minutes) the convection heater element is also activated. Program desired cooking time and grill mode by touching TIME keys and GRILL key. When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. The relay RY5 is energized and the grill heating element is energized.
4. The relay RY3 is energized, if the cavity temperature is lower than 210°C. When the cavity temperature reaches 210°C, relay RY4 and RY3 are de-energized.
5. Now, the food is grilled by the grill heating elements..

### **DUAL COOKING CONDITION**

#### **MICROWAVE AND CONVECTION (Figure O-5)**

Program desired cooking time and Dual cook mode by touching the TIME keys and DUAL COOK key once. When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and

convection motor are energized.

3. Relay RY3 is energized (If the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the convection heating element.
4. Relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by the microwave and convection heating elements energy simultaneously.

### **DUAL COOKING CONDITION**

#### **MICROWAVE AND GRILL (Figure O-6)**

Program desired cooking time and Dual cook mode by touching the TIME keys and DUAL COOK key twice. When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. Relay RY5 is energized and the main supply voltage is applied to the grill heating element.
4. Relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by the microwave and grill heating elements energy simultaneously.

### **POTATO, INSTANT ACTION**

When the menu and quantity are input, the oven chooses cooking mode (Microwave, Convection, Grill or Dual) and sets cooking time automatically according to the pre-programmed information in IC-1 (LSI).

## FUNCTION OF IMPORTANT COMPONENTS

### DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever pushes lower latch head on the door upward. The upper latch head is linked with the lower latch head, so now, the door can be opened.

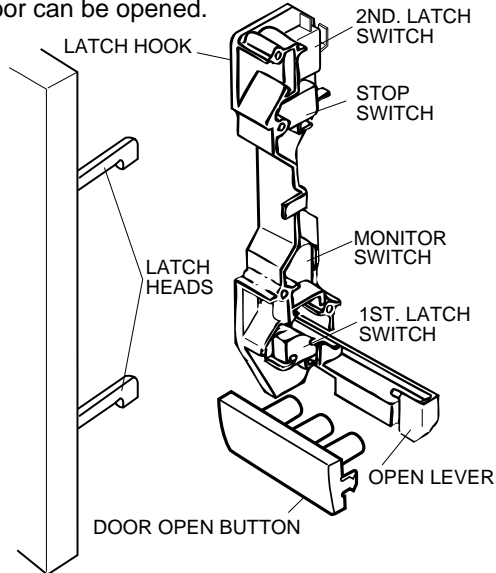


Figure D-1. Door Open Mechanism

### 1ST LATCH SWITCH SW1, 2ND LATCH SWITCH SW2 AND STOP SWITCH SW3

1. When the oven door is closed, the contacts COM-NO of each switch must be closed.
2. When the oven door is opened, the contacts COM-NO of each switch must be opened.

### MONITOR SWITCH SW4

The monitor switch is activated (the contacts opened) by the lower latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F2 (F6.3A) when the contacts of the 1st latch switch SW1 fail to open when the door is opened.

#### Function

1. When the door is opened, the contacts (COM-NC) of monitor switch SW4 close (to the ON condition) due to their being normally closed and contacts (COM-NO) open. At this time the 1st latch SW1 is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch SW3 contacts (COM-NC) are opened and contacts (COM-NO) closed and 2nd latch switch SW2 contacts COM-NO are closed and then the 1st latch switch and stop switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened and the 1st latch switch SW1 contacts fail to open, the fuse F2 (F6.3A) blows immediately after closing of the monitor switch (COM-NC) contacts.

**CAUTION:** BEFORE REPLACING A BLOWN FUSE F2 F6.3A TEST THE 1ST LATCH SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION.  
(REFER TO CHAPTER "TEST PROCEDURE").

### MONITOR RESISTOR R1

The monitor resistor prevents the fuse F2 F6.3A 250V bursting when the fuse F2 F6.3A 250V blows due to the operation of the monitor switch circuit.

### FUSE F1 15A 250V

If the wire harness or electrical components are short-circuited, this fuse F1 15A 250V blows to prevent an electric shock or fire hazard.

### FUSE F2 F6.3A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when 1st latch switch SW1 remains closed with the oven door open and when the monitor switch SW4 contact (COM-NC) closes.

### FUSE F3 F10A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when the asymmetric rectifier, H.V. rectifier, .H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.

### TC TRANSFORMER

TC transformer converts A.C. line voltage into low voltage to drive the control unit.

### THERMAL CUT-OUT TC1 170°C (OVEN)

The thermal cut out protects the oven against overheat during grill cooking, convection cooking or dual (combination) cooking. If the temperature rises above 170°C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the thermal cut-out opens and switches off the all electrical parts.

The defective thermal cut-out must be replaced with a new one.

### THERMAL CUT-OUT TC2 125°C (MG)

This thermal cut-out protects the magnetron against over-heat. If the temperature goes up higher than 125°C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out TC2 will open and line voltage to the high voltage transformer T will cut off and operation of the magnetron MG will be stopped. The defective thermal cut-out must be replaced with a new one.

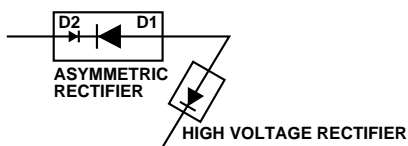
### THERMAL CUT-OUT TC3 190°C (CONV.)

The thermal cut out protects the convection motor CM against overheat. If the temperature of the thermal cut-out TC3 rises above 190°C because the convection fan is interrupted, the ventilation openings are obstructed or the other abnormal matter occurs, the thermal cut-out opens and switches off the convection heating element and conv. indicator light. When the oven cools itself down to the operating temperature of 170°C, the contacts of the thermal cut-out will close again.



## ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the fuse F3 F10A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the peak reverse voltage goes beyond the rated peak reverse voltage. (The process of blowing the fuse F3 F10A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 10A flow through the primary winding of the high voltage transformer.
6. The fuse F3 F10A blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

## NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

## TURNTABLE MOTOR TTM

The turntable motor drives the roller stay to rotate the turntable.

## FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

## CONVECTION MOTOR CM

The convection motor drives the convection fan and provides the heated air.

## GRILL HEATING ELEMENT GH

The grill heating element is provided to brown the food and is located on the top of the oven cavity.

## CONVECTION HEATING ELEMENT CH

The convection heating element is located at the rear of the oven cavity. It is intended to heat air driven by the convection fan. The heated air is kept in the oven and force-circulated and reheated by the convection heating element.

## CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is not directly heated up by the convection heating element, but is instead heated by forced circulation of the hot air produced by the convection heating element.

The air heated by the convection heating element is circulated through the convection passage provided on the outer casing of the oven cavity by means of the convection fan which is driven by the convection motor. It then enters the inside of the oven through the vent holes provided on the back side of the oven. Next, the hot air heats the food on the turntable and leaves the oven cavity through the vent in the oven cavity rear wall.

Without leaving the oven, this hot air is reheated by the convection heating element, passes through the convection passage and enters the inside of the oven cavity again, in a continuing cycle.

In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked.

When the temperature inside the oven cavity reaches the selected temperature, the convection heating element is de-energized. When the temperature inside the oven cavity drops below the selected temperature, the convection heating element is energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature.

When the convection time reaches "0", the convection heating element is de-energized and the convection fan stops operating and the oven shuts off. At the high temperature (more than 104°C), the fan motor remains rotating. Automatically the fan motor will be shut down at low temperature (less than 104°C).

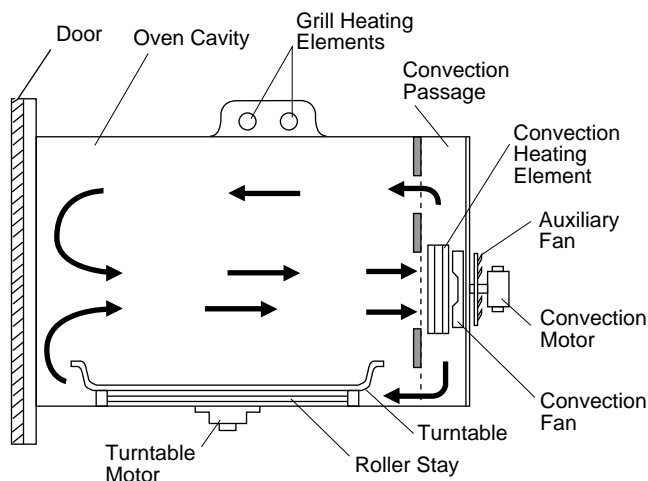


Figure D-2. Convection Cooking System

## DAMPER OPEN-CLOSE MECHANISM

Usually, the damper is in the open position except during convection cooking, grill cooking and dual cooking.

Damper position is set automatically by damper motor, damper switch, damper cam and damper shaft.

These components are operated by a signal that judges if microwave cooking or other cooking operation is selected by the CPU unit.

### Microwave Cooking:

Damper is in the open position, because a portion of cooling air is channeled through the cavity to remove steam and vapors given off from the heating foods.

It is then exhausted at the top of the oven cavity into a condensation compartment.

### Convection, Grill and Dual Cooking:

Damper is in the closed position, so that no hot air will be allowed to leak out the oven cavity.

### Damper Operation

1. When power supply cord is plugged in:
  - 1-1. When power supply cord is plugged in, a signal is sensed in the control unit, and operates shut-off relay (RY7).
  - 1-2. Contacts of shut-off relay (RY7) close, the damper motor is energized, opening the damper door.
  - 1-3. When the damper is moved to the open position by the damper cam, damper switch is closed (ON position).
  - 1-4. The signal of damper switch is re-sensed in the control unit and shut-off relay (RY7) is turned off.
  - 1-5. The A.C. line voltage A.C. to the damper motor is stopped and the motor turns off.
2. When oven is microwave cooking:
 

Damper is in the open position
3. When oven is convection, grill or dual cooking:
  - 3-1. Damper motor is energized right after the oven is started.
  - 3-2. When damper is in the closed position (damper switch is OFF), its signal is sensed by the control unit, and shut-off relay (RY7) is de-energized.
  - 3-3. The damper is held in the closed position during the cooking operation
  - 3-4. At the end of the cooking, shut-off relay (RY7) is energized, and the damper is returned to the open position.

NOTE: If the damper door is not in the proper position, closed during convection, grill or dual, or open during microwave, the control unit will stop oven operation after 1 minute.

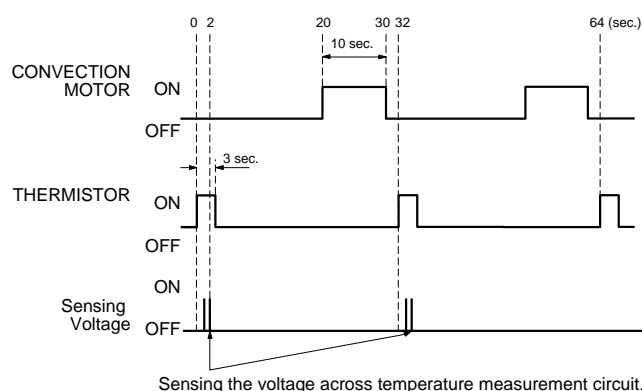
Cooking Mode	Operation of Damper
Microwave cooking	OPEN
Convection cooking	CLOSE
Grill cooking	CLOSE
Dual cooking	CLOSE

## SENSING FIRE OPERATION

The oven will stop its operation when there is a fire in the oven cavity in microwave cooking condition.

LSI measures the voltage across the temperature measurement circuit intermittently within a 32-second time base after since the oven is started in microwave cooking condition. The oven will stop its operation when the difference of the voltages is more than 0.3 volts in microwave cooking condition.

1. Within a 32-second base, first the thermistor is energized for 3 seconds. After 2 seconds since the thermistor is energized, the voltage across the temperature measurement circuit is measured. And after 21 seconds since the thermistor is cut off, the convection motor operates for 10 seconds.
2. The oven carries out the procedure above again. If the second voltage is 0.3V higher than the first voltage, LSI judges it is a fire in the oven cavity and stops the oven.
3. When sensor cooking, the sensing fire operation is not carried out until the oven senses the steam from food. Because food cannot be cooked well by rotating the convection fan at that time. After sensing the steam, the sensing fire operation is started.
4. When LSI judges it is fire in the oven cavity, LSI will switch off the relays to the power transformer, fan motor and convection motor and LSI stops counting down. And then the damper is closed so that the fresh air does not come into the oven cavity.



## SERVICING

### WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with following parts will result in electrocution.

High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

#### REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

#### WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the high voltage transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the high voltage transformer.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and microwave leakage test carried out.

#### REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the microwave timer for two (2) minutes. And set the power level to HIGH (100%) and push the start key. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

## TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

**IMPORTANT:** If the oven becomes inoperative because of a blown fuse F2 (F6.3A) in the 1st latch switch - monitor switch - monitor resistor circuit, check the 1st latch switch, monitor switch and monitor resistor before replacing the fuse F2 (F6.3A).

TEST PROCEDURE		A	B	C		D	E	E	E	E	F	E	G	G	G	H
POSSIBLE CAUSE AND DEFECTIVE PARTS		MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	H.V. HARNESS	HIGH VOLTAGE CAPACITOR	1ST. LATCH SWITCH	2ND. LATCH SWITCH	STOP SWITCH	MONITOR SWITCH	MONITOR RESISTOR	DAMPER SWITCH	THERMAL CUT-OUT 170°C TC1	THERMAL CUT-OUT 125°C TC2	THERMAL CUT-OUT 190°C TC3	TURNTABLE MOTOR
PROBLEM																
OFF CONDITION	Fuse F2 F6.3A browns when the door is opened.						○									
	Home fuse blows when power cord is plugged into wall outlet.															
	Fuse F1 15A browns when power cord is plugged into wall outlet.															
	"88:88" does not appear in display when power cord is plugged into wall outlet.												○			
	Display does not operate properly when STOP/CLEAR key is touched.								○							
	Oven lamp does not light when door is opened. (Display operates.)								○							
COOKING CONDITION (COMMON MODE)	Oven does not start when the START key is touched. (Display operates.)								○							
	Oven lamp does not light And turntable motor does not operate.															○
	Fan motor does not operate. (Oven lamp lights.)															
	Convection fan motor does not operate. (Oven lamp lights.)							○								
	Turntable motor does not operate. (Oven lamp lights.)							○								○
	Oven or any electrical parts (except fan motor) does not stop when cooking time is 0 or STOP/CLEAR key is touched.															
	Oven stops after about 4 minutes since START key is touched. (Except Microwave and Dual Cook modes)															
	Display operates properly but all electrical parts do not operate.															
	The oven stops 1 minute after starting.											○				
	Oven goes into cook cycle but shuts down before end of cooking cycle.												○			
	After cooking, the temperature of oven cavity is higher than 104°C but the fan motor does not operate.															
MICROWAVE COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power control is set at HIGH)	○	○	○	○	○	○			○				○		
	Oven does not seem to be operating properly during variable cooking condition. (Oven operates properly at HIGH)															
	Oven goes into cook cycle but shuts down before end of cooking cycle.												○			
CONVECTION COOKING CONDITION	Convection heating element does not heat.							○							○	
	Oven seems to be operate when the temperature in the oven cavity is lower or higher than preset one.															
GRILL COOKING CONDITION	Grill heating element does not heat.							○							○	
	Convection heating element does not stop when the temperature of oven cavity is higher than 210°C or it stop to heat when the temperature of oven cavity is lower than 210°C															
DUAL COOKING CONDITION (COMMON MODE)	Oven goes into cook cycle but shuts down before end of cooking cycle.												○			
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly)	○	○	○	○	○	○			○				○		
DUAL COOKING CONDITION (MICRO./CONV.)	Oven seems to be operating but the temperature of oven cavity is lower or higher than preset one.															
	Convection heating element does not heat.							○							○	
DUAL COOKING CONDITION (MICRO./GRILL)	Grill heating element does not heat.							○							○	



## TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
------------------	----------------

A

### MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

#### CARRY OUT 3D CHECK

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

#### MICROWAVE OUTPUT POWER (IEC-705-1988)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately  $P \times t / 4.187$  calorie is generated. On the other hand, if the temperature of the water with V(ml) rises  $\Delta T$  (°C) during this microwave heating period, the calorie of the water is  $V \times \Delta T$ .

The formula is as follows;

$$P \times t / 4.187 = V \times \Delta T \quad P (W) = 4.187 \times V \times \Delta T / t$$

Our condition for water load is as follows:

Room temperature.....around 20°C      Power supply Voltage.....Rated voltage  
Water load.....1000 g      Initial temperature.....10±2°C      Heating time.....42 sec.  
P=100xΔT

Measuring condition:

1. Container  
The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel  
The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water  
The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000±5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.  
(Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value  $\Delta T$  of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.

## TEST PROCEDURES (CONT'D)

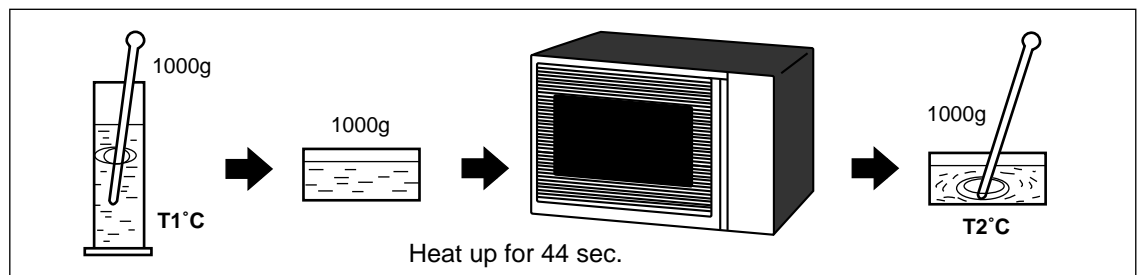
PROCEDURE LETTER	COMPONENT TEST
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6. Measure the final water temperature. (Example: The final temperature  $T_2 = 21^\circ\text{C}$ )
7. Calculate the microwave power output  $P$  in watts from above formula.

Initial temperature .....  $T_1 = 11^\circ\text{C}$   
 Temperature after  $(42 + 2) = 44$  sec. ....  $T_2 = 21^\circ\text{C}$   
 Temperature difference Cold-Warm .....  $\Delta T_1 = 10^\circ\text{C}$   
 Measured output power  
 The equation is " $P = 100 \times \Delta T$ " .....  $P = 100 \times 10^\circ\text{C} = 1000$  Watts

**JUDGMENT:** The measured output power should be at least  $\pm 15\%$  of the rated output power.

**CAUTION:**  $1^\circ\text{C}$  CORRESPONDS TO 100 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



### B HIGH VOLTAGE TRANSFORMER TEST

**WARNING:** High voltages and large currents are present at the secondary winding and filament winding transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

a. Primary winding	1.22 ohms approximately
b. Secondary winding	81.7 ohms approximately
c. Filament winding	less than 1 ohm

If the reading obtained are not stated above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

### C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

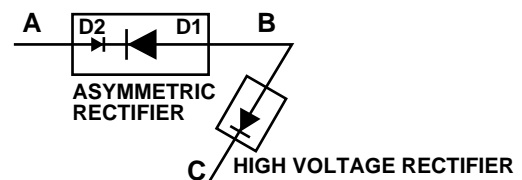
CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 k $\Omega$  in the other direction.

CARRY OUT 4R CHECKS

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



## TEST PROCEDURES (CONT'D)

### PROCEDURE LETTER

### COMPONENT TEST

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.

CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

### D

#### HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal. If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

### E

#### SWITCH TEST

CARRY OUT 3D CHECKS

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal, NO; Normally open terminal NC; Normally close terminal

S.C.; Short, O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch or replace the switch.

CARRY OUT 4R CHECKS.

### F

#### MONITOR RESISTOR TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the monitor resistor.

Using an ohmmeter and set on a low range.

Check between the terminals of the monitor resistor as described in the following table.

Table: Resistance

Resistor	Resistance
Monitor resistor	Approx. 4.3Ω

If incorrect readings are obtained, replace the monitor resistor.

CARRY OUT 4R CHECKS



## TEST PROCEDURES (CONT'D)

PROCEDURE  
LETTER

## COMPONENT TEST

G

**THERMAL CUT-OUT TEST**CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

CARRY OUT 4R CHECKS

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)
Thermal cut-out 170°C TC1	This is not resettable type.	Above 170°C	Closed circuit
Thermal cut-out 125°C TC2	This is not resettable type	Above 125°C	Closed circuit
Thermal cut-out 190°C TC3	Below 170°C	Above 190°C	Closed circuit.

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out (MG) TC1 indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure.

An open circuit thermal cut-out (OVEN) TC2 indicates that the oven cavity has overheated, this may be due to no load operation.

An open circuit thermal cut-out (CONV.) TC3 indicates that the convection fan motor winding has overheated, this may be due to resisted ventilation or locked cooling fan or locked convection fan motor.

H

**MOTOR WINDING TEST**CARRY OUT 3D CHECKS

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 182 Ω
Turntable motor	Approximately 16 kΩ
Convection fan motor	Approximately 163 Ω
Damper motor	Approximately 16 kΩ

If incorrect readings are obtained, replace the motor.

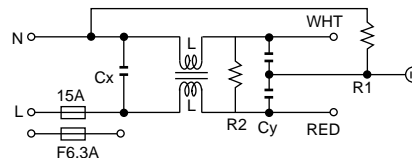
CARRY OUT 4R CHECKS

I

**NOISE FILTER TEST**CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of noise filter.

Using an ohmmeter, check between the terminals as described in the following table.



R1: 10 MΩ ± 20%  
R2: 680 kΩ ± 20%

L (min)	Cx ± 20%	Cy ± 20%
1.0mH	0.22μF	4700pF

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS

## TEST PROCEDURES (CONT'D)

### PROCEDURE LETTER

### COMPONENT TEST

**J**

#### **FUSE F1 15A**

CARRY OUT 3D CHECKS

If the fuse F1 15A is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

**CAUTION: Only replace fuse with the correct value replacement.**

**K**

#### **BLOWN FUSE F2 F6.3A**

CARRY OUT 3D CHECKS

1. If the fuse F2 F6.3A is blown when the door is opened, check the 1st latch switch, monitor switch and monitor resistor.
2. If the fuse F2 F6.3A is blown by incorrect door switching replace the defective switch(es) and the fuse F2 F6.3A.
3. If the fuse F2 F6.3A is blown, there could be a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

**CAUTION: Only replace fuse F2 F6.3A with the correct value replacement.**

**L**

#### **BLOWN FUSE F3 F10A**

CARRY OUT 3D CHECKS

1. If the fuse F3 F10A is blown, there could be shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.
2. If the fuse F3 F10A is blown, there could be shorts in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

**CAUTION: Only replace fuse F3 F10A with the correct value replacement.**

**M**

#### **CONVECTION HEATING ELEMENT AND GRILL HEATING ELEMENT TEST**

CARRY OUT 3D CHECKS

Before carrying out the following tests make sure the heating element is cool completely.

1. Resistance of heating element.

Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.

Table: Resistance of heating element

Parts name	Resistance
Convection heating element	Approximately 39 $\Omega$
Grill heating element	Approximately 22 $\Omega$ x 2 = 44 $\Omega$

2. Insulation resistance.

Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100M $\Omega$  insulation tester. The insulation resistance should be more than 10M $\Omega$  in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

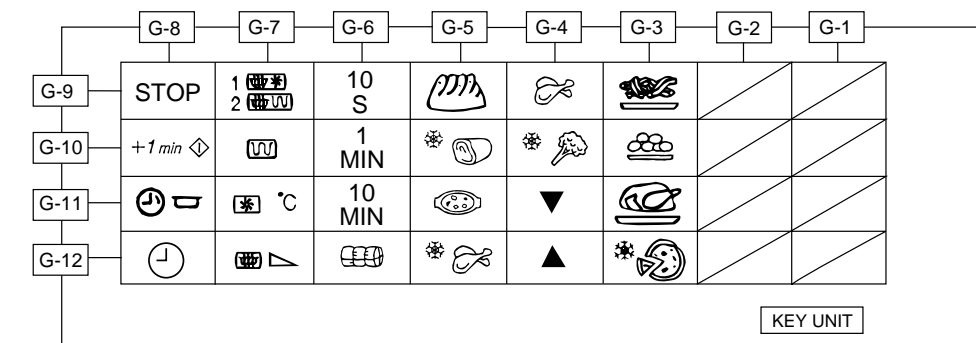
**TEST PROCEDURES (CONT'D)**

PROCEDURE LETTER	COMPONENT TEST				
<b>N</b>	<p><b>THERMOSTAT TEST</b></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect connector B from CPU unit. Measure the resistance of thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's B5 and B6 of the thermistor harness.</p> <table border="1"> <tr> <td>Room Temperature</td><td>Resistance</td></tr> <tr> <td>20°C - 30°C</td><td>Approximately 326 kΩ - 175 kΩ</td></tr> </table> <p>If the merter does not indicate above resistance, replace the thermistor.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Room Temperature	Resistance	20°C - 30°C	Approximately 326 kΩ - 175 kΩ
Room Temperature	Resistance				
20°C - 30°C	Approximately 326 kΩ - 175 kΩ				
<b>K</b>	<p><b><u>TOUCH CONTROL PANEL ASSEMBLY TEST</u></b></p> <p>The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.</p> <p>In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by replacement is described according to the symptoms indicated.</p> <ol style="list-style-type: none"> <li>1. Key Unit.      Note: Check key unit ribbon connection before replacement. The following symptoms indicate a defective key unit. Replace the key unit. <ol style="list-style-type: none"> <li>a) When touching the pads, a certain pad produces no signal at all.</li> <li>b) When touching a number pad, two figures or more are displayed.</li> <li>c) When touching the pads, sometimes a pad produces no signal.</li> </ol> </li> <li>2. Control Panel The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure L) to determine if control unit is faulty. <ol style="list-style-type: none"> <li>2-1 In connection with pads. <ol style="list-style-type: none"> <li>a) When touching the pads, a certain group of pads do not produce a signal.</li> <li>b) When touching the pads, no pads produce a signal.</li> </ol> </li> <li>2-2 In connection with indicators <ol style="list-style-type: none"> <li>a) At a certain digit, all or some segments do not light up.</li> <li>b) At a certain digit, brightness is low.</li> <li>c) Only one indicator does not light.</li> <li>d) The corresponding segments of all digits do not light up; or they continue to light up.</li> <li>e) Wrong figure appears.</li> <li>f) A certain group of indicators do not light up.</li> <li>g) The figure of all digits flicker.</li> </ol> </li> <li>2-3 Other possible problems caused by defective control unit. <ol style="list-style-type: none"> <li>a) Buzzer does not sound or continues to sound.</li> <li>b) Clock does not operate properly.</li> <li>c) Cooking is not possible.</li> </ol> </li> </ol> </li> </ol>				
<b>L</b>	<p><b><u>KEY UNIT TEST</u></b></p> <p>If the display fails to clear when the STOP pad is depressed, first verify the flat ribbon is marking good contact, verify that the door sensing switch(stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch(stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jamper wire between the pins that correspond to the STOP pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.</p>				

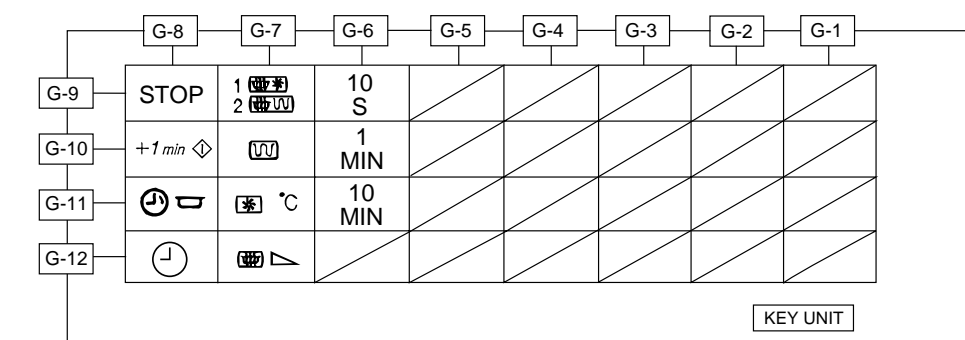
## TEST PROCEDURES (CONT'D)

### PROCEDURE LETTER

### COMPONENT TEST



### R-7A55(B)/(W)



### R-7E45(B)/(W)

### CARRY OUT 4R CHECKS

### M

### RELAY TEST

### CARRY OUT 3D CHECKS

Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 9 pin connector (A) on the control unit with an A.C. voltmeter.  
The meter should indicate 220~230 volts, if not check oven circuit.

### Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, convection cooking operation or grill cooking operation.

DC. voltage indicated ..... Defective relay.

DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 20.0V.D.C.	Oven lamp/Turntable motor
RY2	Approx. 18.5V.D.C.	High voltage transformer
RY3	Approx. 20.0V.D.C.	Convection heating element
RY4	Approx. 26.0V.D.C.	Convection motor
RY5	Approx. 20.0V.D.C.	Grill heating element
RY6	Approx. 26.0V.D.C.	Fan motor
RY7	Approx. 26.0V.D.C.	Damper motor

### CARRY OUT 4R CHECKS

## TEST PROCEDURES (CONT'D)

PROCEDURE  
LETTER

## COMPONENT TEST

N

**PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD(PWB) IS OPEN**

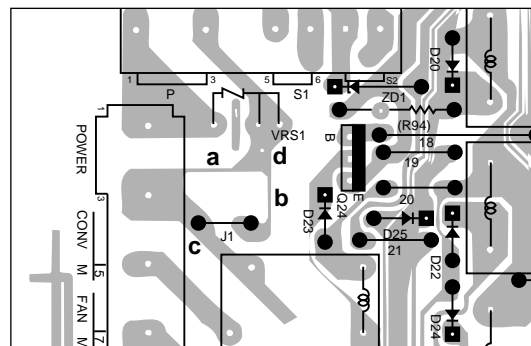
To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

CARRY OUT 3D CHECKS

NOTE: At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS

## TOUCH CONTROL PANEL ASSEMBLY

### OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Key Unit
- (2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

#### Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through R20-R23. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R82, R83 and R90-R93 to perform the function that was requested.

#### Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit and indicator circuit.

#### 1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

#### 2) Power Source Circuit

This circuit generates voltages necessary in the control unit.

Symbol	Voltage	Application
VC	-5.1V	LSI(IC1)
VP	-26V	Fluorescent display tube : Grid and anode voltage
VF1	2.9Vac	Filament of fluorescent display tube
VF2		(VF1 to VF2 voltage)

#### 3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the

clock circuit. It accompanies a very small error because it works on commercial frequency.

#### 4) ACL Circuit

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

#### 5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completionsound).

#### 6) Door Sensing Switch (Stop Switch)

A switch to "tell" the LSI if the door is open or closed.

#### 7) Relay Circuit

To drive the magnetron, fan motor, turntable motor and light the oven lamp.

#### 8) Indicator Circuit

Indicator element is a Fluorescent Display. Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode. The Fluorescent Display has 6-digits, 13-segments are used for displaying figures.

#### 9) Temperature Measurement Circuit

The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The result of detecting is given to LSI controlling the relay and display.

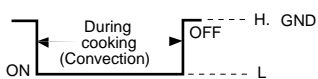
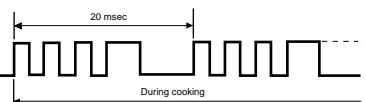
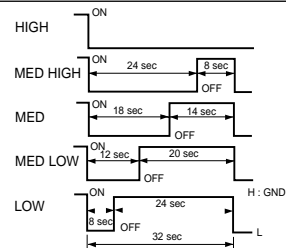
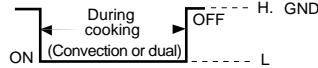
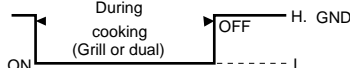
#### 10) Damper switch

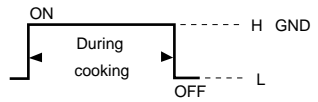
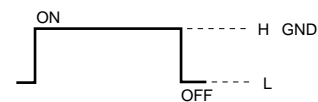
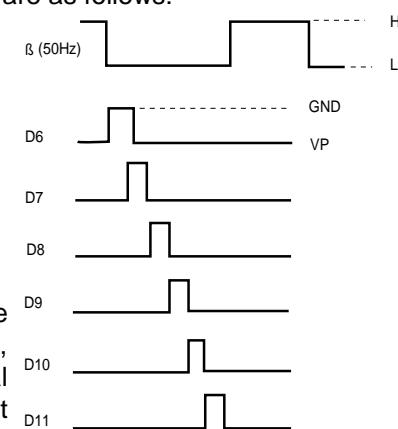
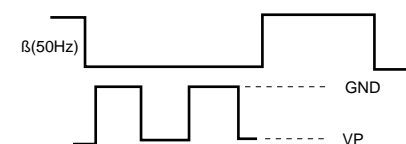
A switch to tell the LSI if the damper is open or close.

## DESCRIPTION OF LSI

## LSI(IZA516DR)

The I/O signal of the LSI(IZA516DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1	R60	OUT	<b>Convection motor driving signal.</b> To turn on and off shut-off relay (RY4). "L" level during CONVECTION; "H" level otherwise. 
2	R61	OUT	<b>Oven lamp and turntable motor driving signal. (Square Waveform : 50Hz)</b> To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit and relays (RY2, RY3, RY4, RY5) control circuit. 
3	R62	OUT	Terminal not used.
4	R63	OUT	<b>Magnetron High-voltage circuit driving signal.</b> To turn on and off the cook relay (RY2). In P-HI operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED, MED LOW, LOW) the signal turns to "H" level and "L" level in repetition according to the power level. 
5	R70	OUT	Terminal not used.
6	R71	OUT	<b>Heating element driving signal.</b> To turn on and off heater relay (RY3). "L" level during convection cooking or dual cooking; "H" level otherwise. During convection cooking or dual cooking; the signal becomes "H" level when the temperature of the oven cavity exceeds the predetermined temperature. 
7/8	R72/R00	OUT	Terminal not used.
9	R01	OUT	<b>Grill heating element driving signal.</b> To turn on and off the grill heating element relay (RY5). "L" level during grill or dual cooking; "H" level otherwise. 
10	R02	OUT	<b>Timing signal output terminal for temperature measurement(OVEN).</b> "H" level (GND) : Temperature measuring timing. (Convection cooking or dual cooking) / "L" level (-5V) : Thermistor OPEN timing.
11	R03	IN	<b>Input signal which communicates the damper open/close information to LSI.</b> Damper opened; "H" level; signal (0V:GND). Damper closed; "L" level; signal (-5V:VC).
12	TEST	IN	Connected to VC.
13	RESET	IN	<b>Auto clear terminal.</b> Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
14	OSC1	IN	<b>Internal clock oscillation frequency input setting.</b> The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to OSC1 terminal.
15	OSC2	OUT	<b>Internal clock oscillation frequency control output.</b> Output to control oscillation input of OSC2.
16	GND	IN	Connected to VC.
17/18	X1/X2	IN/OUT	Terminal not used.
19	AVSS	IN	Connected to VC.

Pin No.	Signal	I/O	Description																																
20	AN0	IN	<b>Temperature measurement input: OVEN THERMISTOR.</b> By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.																																
21-27	AN1-AN7	OUT	Terminal not used.																																
28	AN8	IN	<b>Input signal which communicates the door open/close information to LSI..</b> Door closed; "H" level signal. Door opened; "L" level signal.																																
29-31	AN9-AN11	IN	Connected to VC.																																
32/33	AVCC/VCC	IN/IN	Connected to GND.																																
34	INT0	IN	<b>Signal synchronized with commercial source frequency(50Hz).</b> This is basic timing for time processing of LSI.																																
35-36	D1-D2	OUT	Terminal not used.																																
37	BUZZ	OUT	<b>Signal to sound buzzer.</b> A: key touch sound(0.12sec.). B: Completion sound(2.4sec.).																																
38	D4	OUT	<b>Cooling fan motor driving signal.</b> To turn on and off shut-off relay (RY6). "H" level during both microwave, Grill and convection cooking; "L" level otherwise. 																																
39	D5	OUT	<b>Damper motor relay driving signal.</b> To turn on and off shut-off relay (RY7). 																																
40-45	D6-D11	OUT	<b>Digit selection signal.</b> The relationship between digit signal and digit are as follows: <table><tr><td><u>Digit signal</u></td><td><u>Digit</u></td></tr><tr><td>D6 .....</td><td>1st.</td></tr><tr><td>D7 .....</td><td>2nd.</td></tr><tr><td>D8 .....</td><td>3rd.</td></tr><tr><td>D9 .....</td><td>4th.</td></tr><tr><td>D10 .....</td><td>5th.</td></tr><tr><td>D11 .....</td><td>6th.</td></tr></table>  Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal (β) period, and input to the grid of the fluorescent display.	<u>Digit signal</u>	<u>Digit</u>	D6 .....	1st.	D7 .....	2nd.	D8 .....	3rd.	D9 .....	4th.	D10 .....	5th.	D11 .....	6th.																		
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D11 .....	6th.																																		
46-47	D12-D13	OUT	<b>Segment data signals.</b> The relation between signals and indicators are as follows: <table><tr><td><u>Signal</u></td><td><u>Segment</u></td><td><u>Signal</u></td><td><u>Segment</u></td></tr><tr><td>D12 .....</td><td>UB</td><td>R91 .....</td><td>f</td></tr><tr><td>D13 .....</td><td>LB</td><td>R92 .....</td><td>g</td></tr><tr><td>R80 .....</td><td>a</td><td>R93 .....</td><td>c</td></tr><tr><td>R81 .....</td><td>h</td><td>R10 .....</td><td>e</td></tr><tr><td>R82 .....</td><td>j</td><td>R11 .....</td><td>p</td></tr><tr><td>R83 .....</td><td>k</td><td>R12 .....</td><td>n</td></tr><tr><td>R90 .....</td><td>b</td><td>R13 .....</td><td>d</td></tr></table>  Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal (β) period, and input to the anode of the fluorescent display.	<u>Signal</u>	<u>Segment</u>	<u>Signal</u>	<u>Segment</u>	D12 .....	UB	R91 .....	f	D13 .....	LB	R92 .....	g	R80 .....	a	R93 .....	c	R81 .....	h	R10 .....	e	R82 .....	j	R11 .....	p	R83 .....	k	R12 .....	n	R90 .....	b	R13 .....	d
<u>Signal</u>	<u>Segment</u>	<u>Signal</u>	<u>Segment</u>																																
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R82 .....	j	R11 .....	p																																
R83 .....	k	R12 .....	n																																
R90 .....	b	R13 .....	d																																



Pin No.	Signal	I/O	Description
48-49	R80-R81	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12.
50	R82	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-3 line keys on key matrix is touched.
51	R83	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-4 line keys on key matrix is touched.
52	R90	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-5 line keys on key matrix is touched.
53	R91	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-6 line keys on key matrix is touched.
54	R92	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-7 line keys on key matrix is touched.
55	R93	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12. <b><u>Key strobe signal.</u></b> Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-8 line keys on key matrix is touched.
56-59	R10-R13	OUT	<b><u>Segment data signal.</u></b> Signal similar to D12..
60	R20	IN	<b><u>Signal coming from touch key.</u></b> When either one of G-9 line keys on key matrix is touched, a corresponding signal will be input into R20. When no key is touched, the signal is held at "L" level.
61	R21	IN	<b><u>Signal coming from touch key.</u></b> When either one of G-10 line keys on key matrix is touched, a corresponding signal will be input into R21. When no key is touched, the signal is held at "L" level.
62	R22	IN	<b><u>Signal coming from touch key.</u></b> When either one of G-11 line keys on key matrix is touched, a corresponding signal will be input into R22. When no key is touched, the signal is held at "L" level.
63	R23	IN	<b><u>Signal coming from touch key.</u></b> When either one of G-12 line keys on key matrix is touched, a corresponding signal will be input into R23. When no key is touched, the signal is held at "L" level.
64	Vdisp	IN	<b><u>Anode (segment) of Fluorescent Display illumination voltage: -26V.</u></b> Vp voltage of power source circuit input.

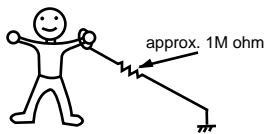
## SERVICING

### 1. Precautions for Handling Electronic Components

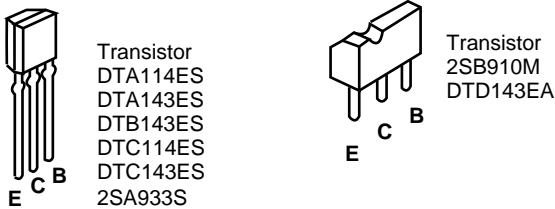
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.



- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



### 2. Shapes of Electronic Components

#### 3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

- (1) Servicing the touch control panel with power supply of the oven:

**CAUTION:**

**THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.**

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

- A. On some models, the power supply cord between

the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

#### (2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed.

Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel. It is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

#### 4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W  
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

#### 5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

## COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

**WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.**

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).
1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

### OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.
6. Discharge the H.V. capacitor before carrying out any further work.
7. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

**CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.**

### HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Disconnect all the leads and terminals of high voltage rectifier assembly from the high voltage capacitor.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly and remove capacitor holder.
4. Remove one (1) screw holding capacitor holder to oven cavity.
5. Release the capacitor holder from the duct.
6. Remove the capacitor from the capacitor holder.
7. Now high voltage rectifier assembly and capacitor should be free.

**CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.**

### HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. wire A from the high voltage transformer.
4. Disconnect the main wire harness from the high voltage transformer.
5. Remove the two (2) screws and one (1) washer holding the transformer to base plate.
8. Remove the transformer.
7. Now the high voltage transformer is free.

### CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the connectors from the control unit.
3. Remove the one (1) screw holding the control panel to the oven cavity and remove the control panel.
4. Lift up the control panel assembly and pull it forward. Now the control panel assembly is free.

## MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the air separate duct B from the chassis support and the air intake duct.
3. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
4. Remove the one (1) screw holding the chassis support to the magnetron.
5. Move the air intake duct to left.
6. Remove the air deflector from the magnetron.
7. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the

magnetron to prevent it from falling.

8. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.
9. Remove the magnetron cushion from the magnetron.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

## FAN MOTOR REPLACEMENT

### REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Disconnect the wire leads from the fan duct.
5. Remove the one (1) screw holding the capacitor holder to the oven cavity back plate.
6. Release the tabs of the capacitor holder from the fan duct.
7. Remove the one (1) screw holding the fan duct to the oven cavity back plate.
8. Remove the fan duct from the oven.
9. Remove the fan duct from the fan motor shaft according the following procedure.
  - 1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

#### CAUTION:

- Make sure that any pieces do not enter the gap between the rotor and the starter of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.
- Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.
- Do not transform the bracket by touching with the pliers.

- 2) Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
- 3) Now, the fan blade will be free.

#### CAUTION:

- Do not use this removed fan blade again. Because the hole (for shaft) of it may become bigger than a standard one.

10. Remove the two (2) screws and nuts holding the fan motor to the fan duct.
11. Now, the fan motor is free.

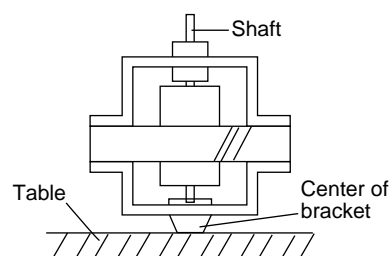
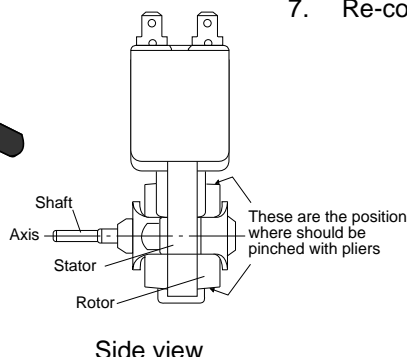
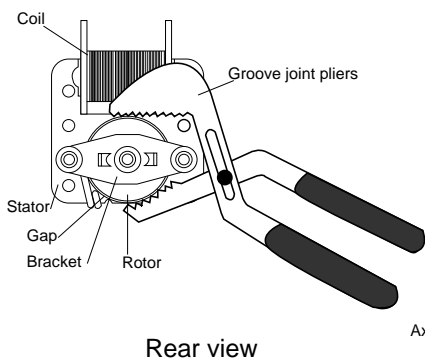
### INSTALLATION

1. Install the fan motor to the fan duct with the two (2) screws and two (2) nuts.
2. Install the fan blade to the fan motor shaft according the following procedure.
  - 1) Hold the centre of the bracket which supports the shaft of the fan motor on the flat table.
  - 2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
  - 3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

#### CAUTION:

- Do not hit the fan blade strongly when installed because the bracket may be transformed.
- Make sure that the fan blade rotates smooth after installed.
- Make sure that the axis of the shaft is not slanted.

3. Install the fan duct to the oven cavity back plate with the one (1) screw.
4. Insert the tabs of the capacitor holder to the fan duct.
5. Install the capacitor holder to the oven cavity back plate with the one (1) screw.
6. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
7. Re-connect the wire leads to the fan motor.



## OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
3. Lift up the oven lamp socket.
4. Now, the oven lamp socket is free.

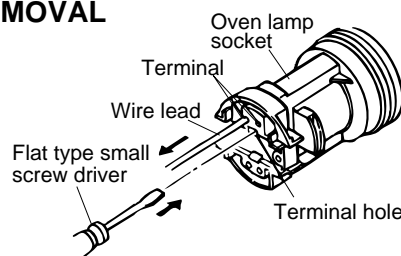


Figure C-1. Oven lamp socket

## POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Pushing the lever of positive lock® connector.
3. Pull out the positive lock® connector.

**CAUTION:** WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACE YOU (SERVICE ENGINEERS).

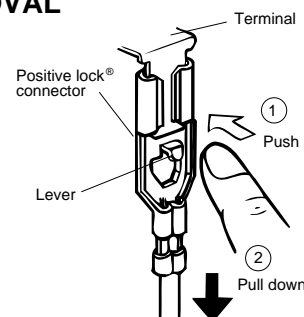


Figure C-2 Positive lock® connector

## POWER SUPPLY CORD REPLACEMENT

### Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the chassis support.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-4 (a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

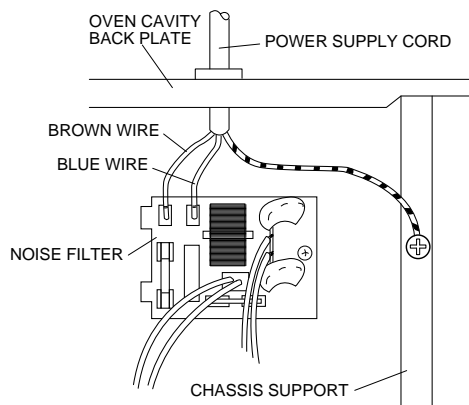


Figure C-4 (a) Replacement of Power Supply Cord

### Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-4 (b).
2. Install the earth wire lead of power supply cord and the earth angle to the oven cavity with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

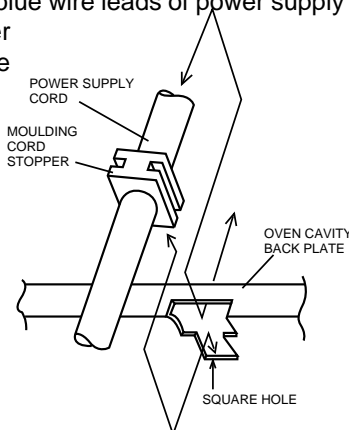


Figure C-4(b). Power Supply Cord Replacement

## CONVECTION HEATING ELEMENT OR CONVECTION FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the four (4) screws holding the back plate to oven cavity.
3. Disconnect the wire leads from the convection heating element, convection motor and thermal cut-out.
4. Remove the three (3) screws holding the convection fan duct to the oven cavity from out-side.
5. Remove the six (6) screws holding the convection fan duct to the oven cavity.
6. Now the convection fan duct is free.

### CONVECTION HEATING ELEMENT

7. Remove the two (2) screws holding the convection air angle A and B to the convection fan duct.

8. Remove the two (2) screws holding the convection heating element to the convection fan duct.
9. Now, the convection heater is free.

### CONVECTION FAN MOTOR

7. Remove the one (1) nut holding the convection fan, washers, pipe and auxiliary fan to the convection fan motor shaft.
8. Remove the two (2) screws holding the convection motor mounting plate to the convection fan duct.
9. Remove the pin on the convection fan motor shaft.
10. Remove the two (2) screws holding the convection motor mounting plate to the convection fan motor.
11. Now, the convection fan motor is free.

## GRILL HEATING ELEMENT ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads to the grill heating element.
3. Remove the two(2) screws holding the exhaust duct assembly to the oven cavity.
4. Push the two tabs holding the grill heating element assembly to the oven cavity.
5. Release the grill heating element assembly from the oven cavity by sliding the cover.
6. Now the grill heating element assembly is free.

## 1ST. LATCH SWITCH, 2ND. LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Push the retaining tab slightly and remove the switch.

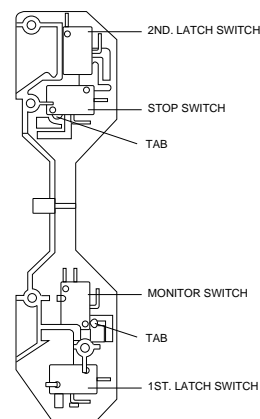


Figure C-5. Switches

## 1ST LATCH SWITCH, 2ND LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the 1st switch, 2nd latch switch, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS
2. Loosen the one (1) screw holding the upper latch hook to the oven cavity front flange and the one (1) screw holding the lower latch hook to the same flange.
3. With the door closed, adjust latch hook by moving it back and forward or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the latch head has pushed the plungers of the monitor switch and 2nd. latch switch with the door closed. The vertical position of the latch hook should be placed where the latch head has pushed the plungers of the 1st. latch switch and stop switch with the door closed and the start button pushed.
4. Secure the screws with washers firmly.
5. Make sure of the all switches operation. If the latch head has not pushed the plungers of the monitor switch and 2nd. latch switch with door closed, adjust the latch hook position. At that time, the latch head should not have pushed the plungers of the 1st. switch and stop switch. If the latch head has not pushed the plungers of the 1st. switch and stop switch with door closed, loose two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

**After adjustment, make sure of the following:**

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling upper portion of door toward the oven face. Then check the lower latch hook position, pushing and pulling lower portion of door toward the oven face. Both results (plays of the door) should be less than 0.5mm.

2. The 1st latch switch and stop switch interrupt the circuit before the door can be opened.
3. The monitor switch contacts of (COM.- NC.) close when the door is opened and the 2nd latch switch contacts of (COM.- NO.) open and contacts of (COM.- NC.) close when the door is opened.
4. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

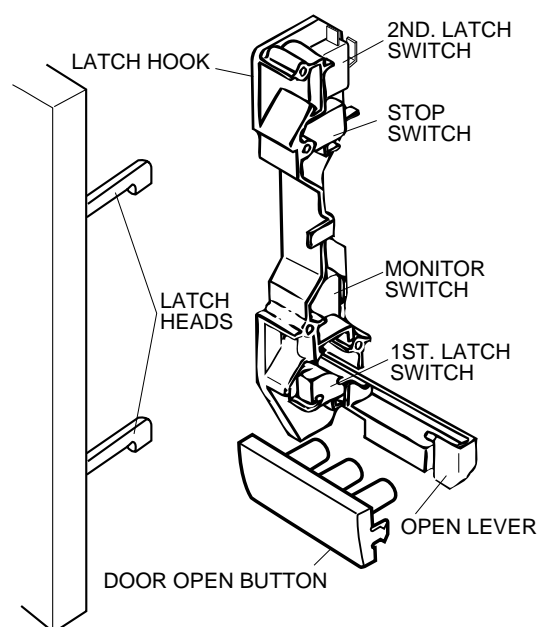


Figure C-6. Switch Adjustment

## DOOR REPLACEMENT AND ADJUSTMENT

### REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Remove three (3) screws holding the lower oven hinge to the oven cavity.
3. Remove door assembly with lower oven hinge by pulling it downward.
4. Separate the door assembly and lower oven hinge. Door assembly is now free.
5. Re-install lower oven hinge to the new door assembly.
6. On re-installing new door assembly, secure the lower oven hinge with the three (3) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.
7. CARRY OUT 4R CHECKS

Note: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

### ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

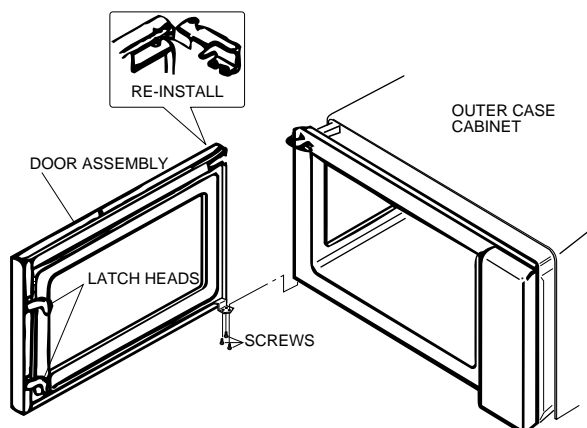


Figure C-7. Door Assembly Replacement and Adjustment

## DOOR PARTS REMOVAL

### CHOKE COVER REMOVAL

1. Insert an iron plate (thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaging part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now choke cove is free.

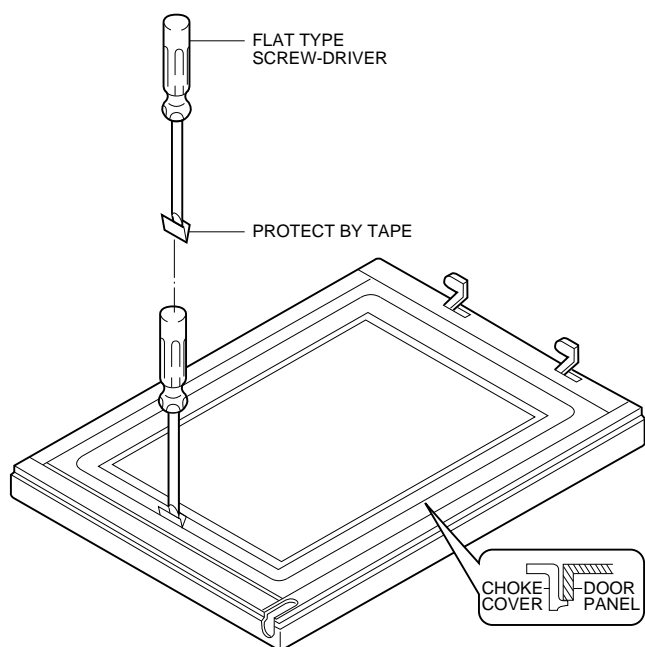


Figure C-8. Choke Cover Removal

### DOOR FRAME AND GLASS REMOVAL

Remove the door assembly, referring to from item 1 through item 4 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Remove the four (4) screws holding the door frame to the door panel assembly.
4. Release the glass stopper from the door frame.
5. Remove the door glass from the door frame.
6. Remove the door frame from the door panel by releasing the three (3) tabs of door frame from door panel with flat type screw driver
7. Lift up the door glass, now the door glass is free.

### LATCH HEAD REMOVAL

1. Remove the door frame referring to "DOOR FRAME and GLASS REMOVAL".
2. Release the latch spring from the tabs of the door panel.
3. Release the latch spring from the latch head.
4. Release the latch head from the door panel.
5. Now, the latch head is free.

## MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

### REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of  $5\text{mW}/\text{cm}^2$  at any point 5cm or more from external surface of the oven.

### PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.

Important:

Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

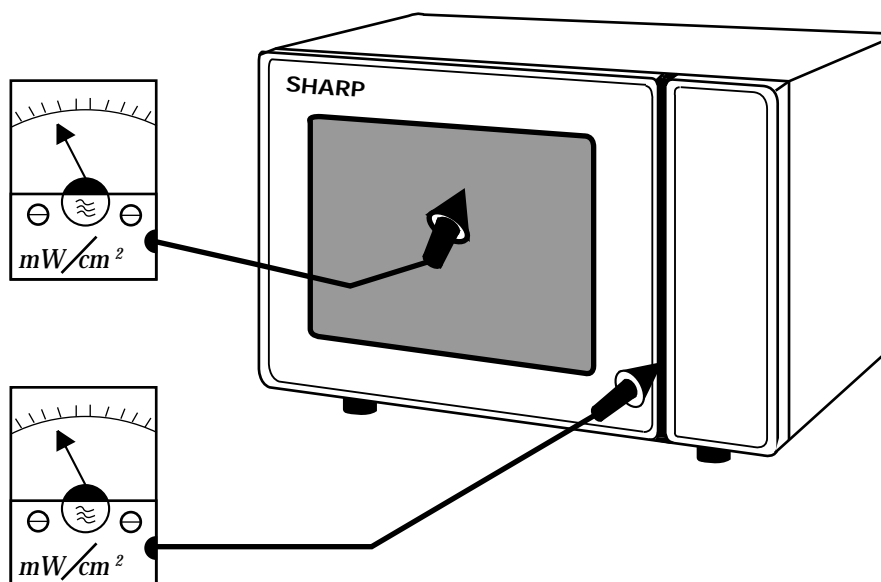
NARDA 8100

NARDA 8200

HOLADAY HI 1500

SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of  $275 \pm 15\text{ml}$  of water initially at  $20 \pm 5^\circ\text{C}$  in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance



## TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F1	15A 250V
Fuse	F2	F6.3A 250V
Fuse	F3	F10A 250V
Monitor resistor	R1	4.3Ω 20W
Thermal cut-out	TC1	170°C
Thermal cut-out	TC2	125°C
Thermal cut-out	TC3	190°C (Off point) 170°C (On point)
Thermistor		Approx. 326 kΩ - 175 kΩ at 20°C - 30°C
Grill heating element	GH	Approx. 22 Ω. x 2 = 44 Ω Insulation resistance > 10MΩ
Convection heating element	CH	Approx. 39Ω Insulation resistance > 10MΩ
Oven lamp	OL	220 - 230 V 25W E14
High voltage capacitor	C	1.2μF AC 2100V
Magnetron	MG	Filament < 1Ω Filament - chassis ∞ ohm.
High voltage transformer	T	Filament winding < 1Ω. Secondary winding Approx. 81.7Ω. Primary winding Approx. 1.22Ω

## TEST POINTS ON CONTROL UNIT

In/Out put terminal	Test Point	Volt	Resistance (Disconnect the power and door is closed)
Input terminal (Power supply)	A1 - A3	220 - 230V	Approx. 480 Ω
Input terminal (Stop switch)	B1 - B2	-	0
Input terminal (Thermistor)	B5 - B6	DC. 5V	Approx. 69 kΩ at 20°C - 30°C
Output terminal (Grill heating element)	N.O of RY5 - A1	220 - 230V	Approx. 170 Ω
Output terminal (Convection heating element)	N.O of RY3 - A1	220 - 230V	Approx. 200 Ω
Output terminal (Fan motor)	A1 - A7	220 - 230V	Approx. 340 Ω
Output terminal (Turntable motor and Oven lamp)	N.O of RY1 - A1	220 - 230V	Approx. 190 Ω
Output terminal (Convection fan motor)	A1 - A5	220 - 230V	Approx. 300 Ω
Output terminal (Earth)	B2 - Chassis	-	0

**WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.**

NOTE: CONDITION OF OVEN

- Note:  
AC CORD CONNECTION  
BRN : BROWN  
BLU : BLUE  
G-Y : GREEN AND  
YELLOW STRIPE  
/15 : SECTIONAL AREA  
OF 1.5mm<sup>2</sup>MIN.



NOTE: CONDITION OF OVEN

- ### Figure O-2 Oven Schematic-Microwave Cooking Condition

### SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. CONVECTION KEY TOUCHED ONCE.
4. START KEY TOUCHED.

Note:

- AC CORD CONNECTION  
BRN : BROWN  
BLU : BLUE  
G-Y : GREEN AND  
YELLOW STRIPE  
/15 : SECTIONAL AREA  
OF 1.5mm<sup>2</sup>MIN.

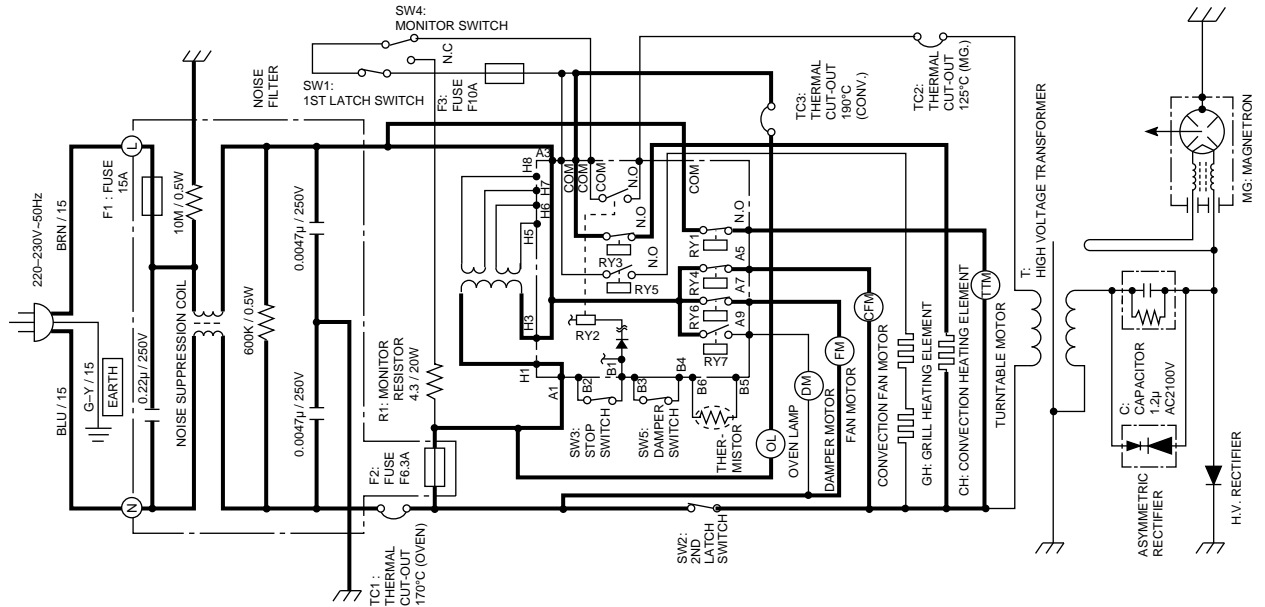


Figure O-3 Oven Schematic-Convection Cooking Condition

### SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. GRILL KEY TOUCHED
4. START KEY TOUCHED.

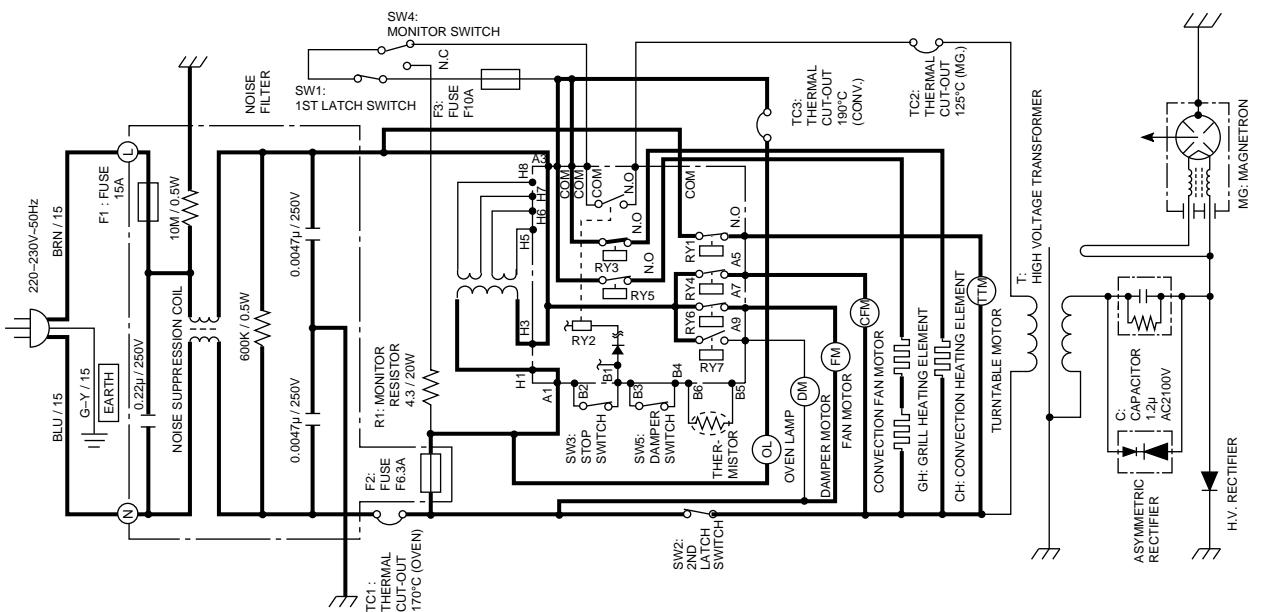


Figure O-4 Oven Schematic-Grill Cooking Condition

### SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. DUAL COOK KEY TOUCHED ONCE.
4. START KEY TOUCHED.

Note:

- AC CORD CONNECTION  
BRN : BROWN  
BLU : BLUE  
G-Y : GREEN AND  
YELLOW STRIPE  
/15 : SECTIONAL AREA  
OF 1.5mm<sup>2</sup>MIN.

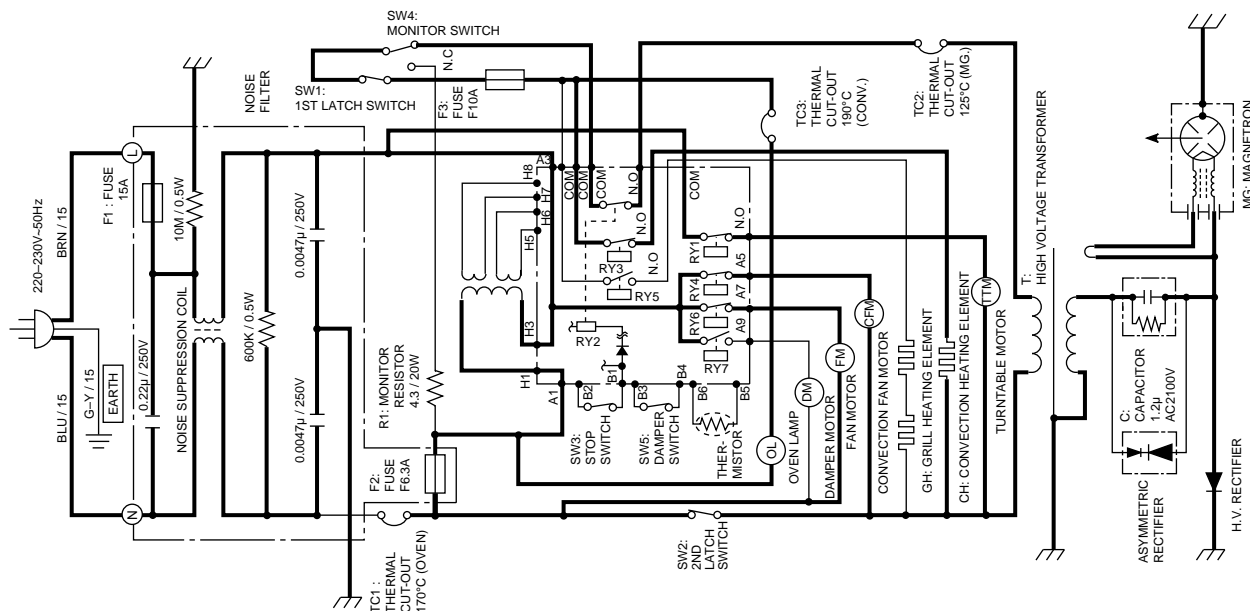


Figure O-5. Oven Schematic-Dual Cooking (microwave and Convection) Condition

### SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. DUAL COOK KEY TOUCHED TWICE.
4. START KEY TOUCHED.

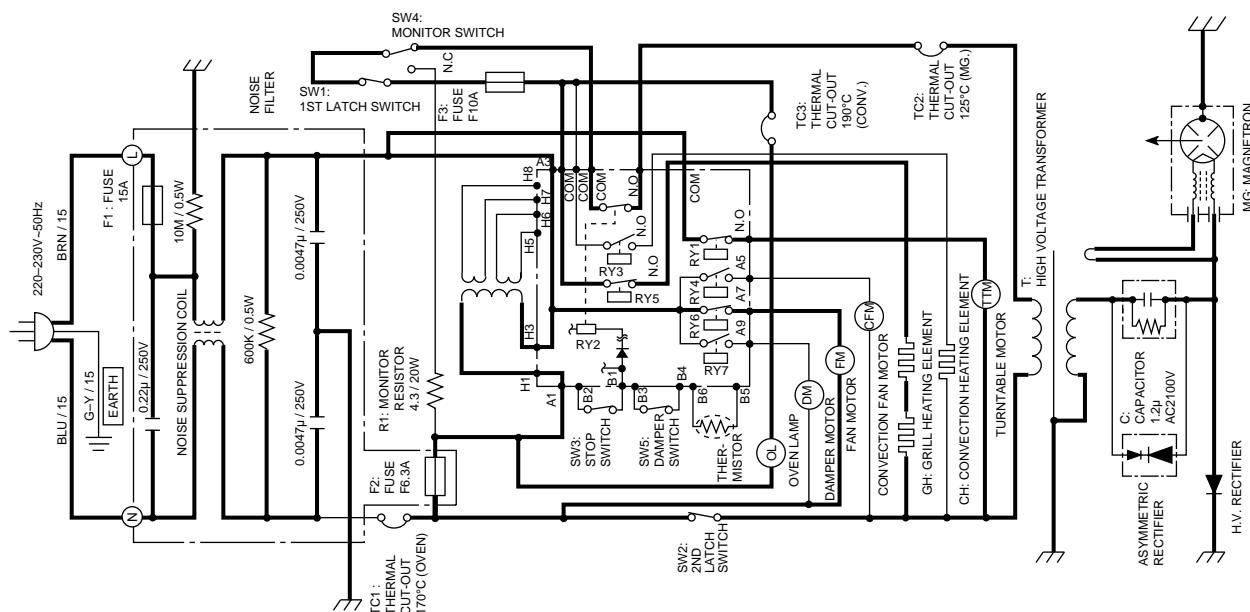


Figure O-6 Oven SchematicDual Cooking (Microwave and Grill) Condition

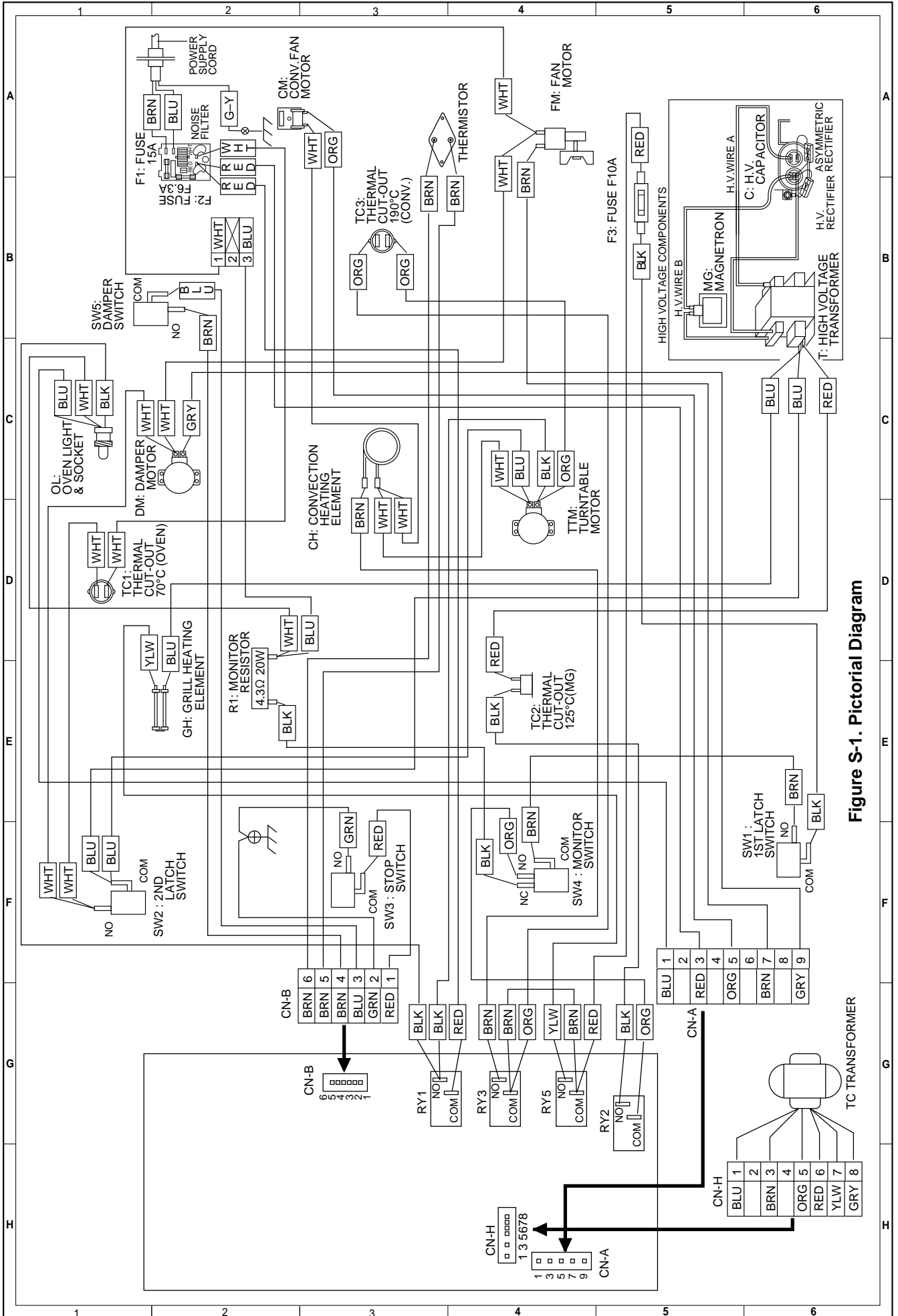


Figure S-1. Pictorial Diagram

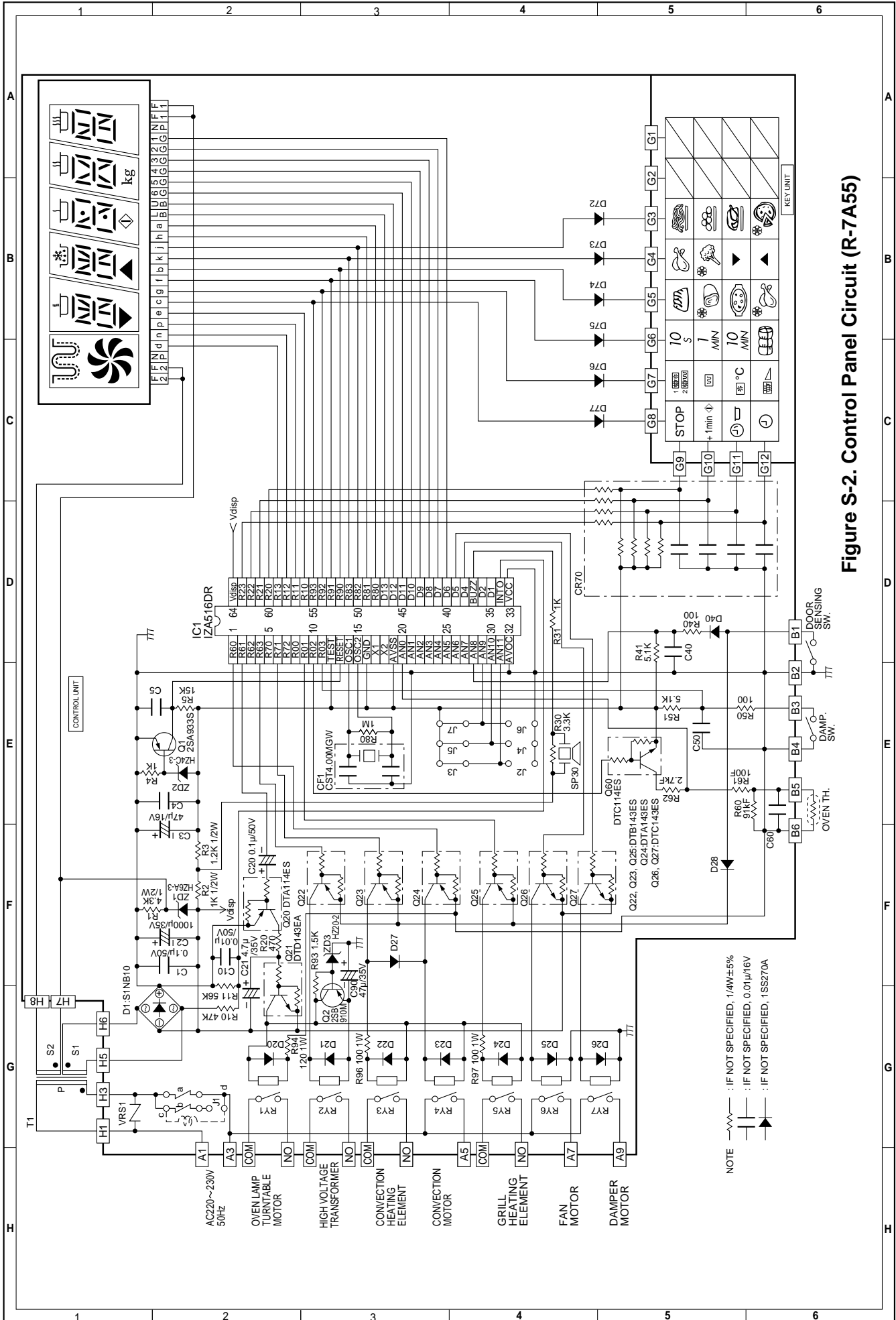
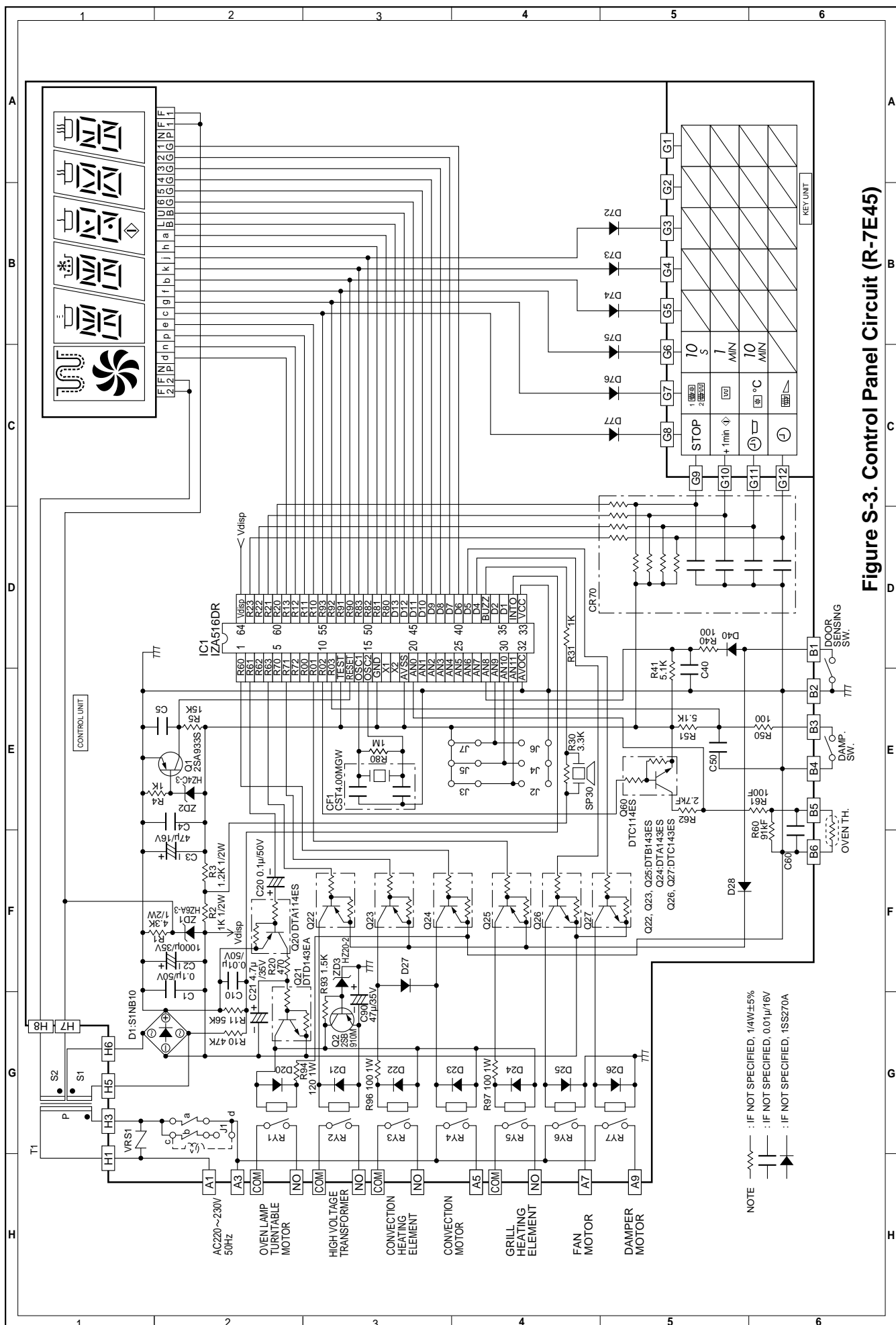


Figure S-2. Control Panel Circuit (R-7A55)



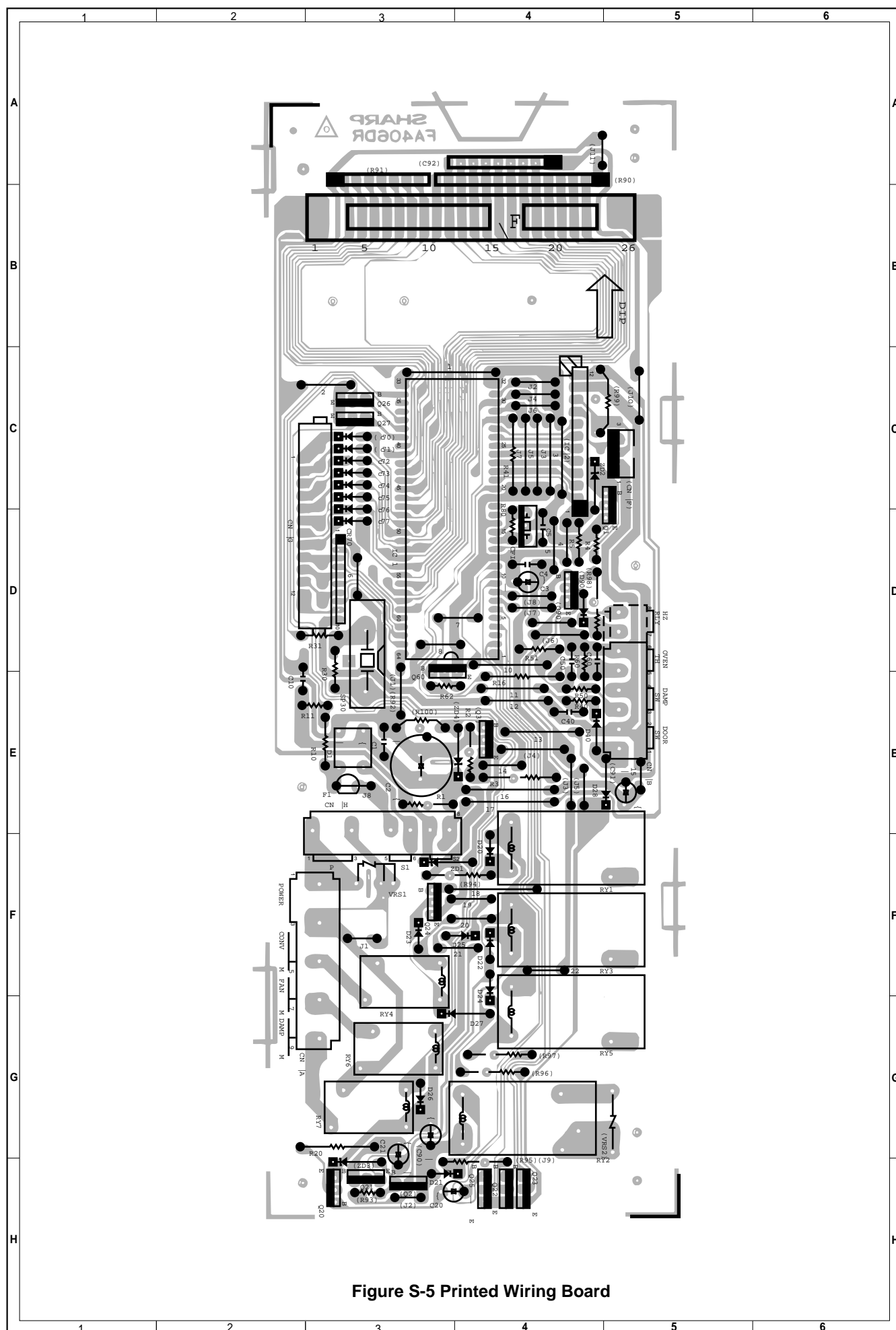


Figure S-5 Printed Wiring Board



## PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "\*\*\*" are used in voltage more than 250V. / "\$" Mark: Spare parts delivery section

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
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## ELECTRIC PARTS

*	C	RC-QZA129WRE0	U	High voltage capacitor	1	AW
	CH	RHET-A117WRE0	U	Convection heating element	1	AW
	CM	RMOTEA285WRE0	U	Convection motor	1	AW
	F1	QFS-CA016WRE0	J	Fuse 15A	1	AD
	F2	QFS-CA011WRE0	J	Fuse F6.3A	1	AC
Δ*	F3	QFS-CA020WRE0	U	Fuse F10A	1	AB
	FM	RMOTEA278WRE0	U	Fan motor	1	AT
	GH	FHET-A045WRK0	U	Grill heating element assembly	1	BB
	MG	RV-MZA177WRE0	U	Magnetron	1	BG
	OL	RLMPTA034WRE0	U	Oven lamp	1	AK
	R1	RR-WZA020WRE0	J	Monitor resistor 4.3Ω 20W	1	AF
	SW1	QSW-MA110WRE0	J	1st latch switch	1	AK
	SW2	QSW-MA110WRE0	J	2nd latch switch	1	AK
	SW3	QSW-MA110WRE0	J	Stop switch	1	AK
	SW4	QSW-MA112WRE0	J	Monitor switch	1	AN
*	SW5	QSW-MA110WRE0	J	Damper switch	1	AK
	T	RTRN-A382WRE0	U	High voltage transformer	1	BN
	TC1	RTHM-A084WRE0	U	Thermal cut-out 170°C (OVEN)	1	AL
	TC2	RTHM-A078WRE0	U	Thermal cut-out 125°C (MG)	1	AL
	TC3	RTHM-A004WRE0	J	Thermal cut out 190°C (CONV.)	1	AL
	DM	RMOTDA183WRE0	U	Damper motor	1	AV
	TTM	RMOTDA148WRE0	J	Turntable motor	1	AP
	1- 1	FH-HZA007WRE0	U	Thermistor	1	AH
	1- 2	RTRN-A401WRE0	J	TC transformer	1	AW
	1- 3	FACCVA003WRK0	U	Power supply cord assembly	1	AP
*	1- 4	FH-DZA033WRE0	U	High voltage rectifier assembly	1	AP
	1- 5	FPWBFA276WRE0	U	Noise filter	1	AW
	1- 6	QFSHDA002WRE0	U	Fuse holder	1	AE
	1- 7	QSOCLA011WRE0	J	Oven lamp socket	1	AH

## CABINET PARTS

Δ	2- 1	GCABDA064WRP0	U	Back plate	1	AP
	2- 2	GCABDA065WRP0	U	Sub back plate	1	AH
	2- 3	GCABUA445WRP0	U	Outer case cabinet (Brown)	1	AX
	2- 3	GCABUA444WRP0	U	Outer case cabinet (White)	1	AX
	2- 4	MHNG-A325WRM0	U	Lower oven hinge	1	AC
	2- 5	GDAI-A219WRP2	U	Base plate	1	AS
	2- 6	GLEGPA028WRE0	U	Foot	4	AA

## CONTROL PANEL PARTS

	3- 1	CPWBFA564WRK0	J	Control unit	1	BT
	3- 1A	QCNCMA227DRE0	J	9-pin connector (A)	1	AC
	3- 1B	QCNCMA267DRE0	J	6-pin connector (B)	1	AC
	3- 1C	QCNCWA030DRE0	J	12-pin connector (G)	1	AE
	3- 1D	QCNCMA346DRE0	J	6-pin connector (H)	1	AK
	3- 1E	RV-KXA058DRE0	J	Fluorescent display tube	1	AY
	C1	RC-KZA087DRE0	J	Capacitor 0.1 uF 50V	1	AB
	C2	RC-EZA238DRE0	J	Capacitor 1000 uF 35V	1	AD
	C3	RC-EZA229DRE0	J	Capacitor 47 uF 16V	1	AB
	C4-5	VCKYD11CY103N	J	Capacitor 0.01 uF 16V	2	AH
	C10	VCTYF31HF103Z	J	Capacitor 0.01 uF 16V	1	AB
	C20	RC-EZA302DRE0	J	Capacitor 0.1 uF 50V	1	AA
	C21	RC-EZA305DRE0	J	Capacitor 4.7 uF 35V	1	AA
	C40	VCKYD11CY103N	J	Capacitor 0.01 uF 16V	1	AH
	C50	VCKYD11CY103N	J	Capacitor 0.01 uF 16V	1	AH
	C60	VCKYD11CY103N	J	Capacitor 0.01 uF 16V	1	AH
	C90	RC-EZA320DRE0	J	Capacitor 47 uF 35V	1	AR
	CF1	RCRS-A012DRE0	J	Ceramic resonator (CST4.00MGW)	1	AD
	CR70	RMPTEA011DRE0	J	CR array	1	AL
	D1	RSRCDA013DRE0	J	Diode bridge (S1NB10)	1	AG
	D20-28	VHD1SS270A/-1	J	Diode (1SS270ATA)	9	AA
	D40	VHD1SS270A/-1	J	Diode (1SS270ATA)	1	AA
	D72-77	VHD1SS270A/-1	J	Diode (1SS270ATA)	6	AA
	IC1	RH-IZA516DRE0	J	LSI	1	AU
	Q1	VS2SA933S/-3	J	Transistor (2SA933S)	1	AB
	Q2	VS2SB910MR/-4	J	Transistor (2SB910M)	1	AE
	Q3	VSDTA114ES/-3	J	Transistor (DTA114ES)	1	AB
	Q21	VSDTD143EA/-4	J	Transistor (DTD143EA)	1	AC
	Q22-23	VSDTB143ES/-3	J	Transistor (DTB143ES)	2	AC
	Q24	VSDTA143ES/-3	J	Transistor (DTA143ES)	1	AB

**Note:** The parts marked "Δ" may cause undue microwave exposure. / The parts marked "\*\*\*" are used in voltage more than 250V. / "\$" Mark: Spare parts delivery section

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
Q25	VSDB143ES/-3	J	Transistor (DTB143ES)	1	AC
Q26-27	VSDB143ES/-3	J	Transistor (DTC143ES)	2	AB
Q60	VSDB143ES/-3	J	Transistor (DTC114ES)	2	AB
R1	VRD-B12HF432J	J	Resistor 4.3k ohm 1/2W	1	AH
R2	VRD-B12HF102J	J	Resistor 1k ohm 1/2W	1	AA
R3	VRD-B12HF122J	J	Resistor 1.2k ohm 1/2W	1	AA
R4	VRD-B12EF102J	J	Resistor 1k ohm 1/4W	1	AA
R5	VRD-B12EF153J	J	Resistor 15k ohm 1/4W	1	AA
R10	VRD-B12EF473J	J	Resistor 47k ohm 1/4W	1	AA
R11	VRD-B12EF563J	J	Resistor 56k ohm 1/4W	1	AA
R20	VRD-B12EF471J	J	Resistor 470 ohm 1/4W	1	AA
R30	VRD-B12EF332J	J	Resistor 3.3k ohm 1/4W	1	AA
R31	VRD-B12EF102J	J	Resistor 1k ohm 1/4W	1	AA
R40	VRD-B12EF101J	J	Resistor 100 ohm 1/4W	1	AA
R41	VRD-B12EF512J	J	Resistor 5.1k ohm 1/4W	1	AA
R50	VRD-B12EF101J	J	Resistor 100 ohm 1/4W	1	AA
R51	VRD-B12EF512J	J	Resistor 5.1k ohm 1/4W	1	AA
R60	VRN-B12EK913F	J	Resistor 91k ohm 1/4W	1	AA
R61	VRN-B12EK101F	J	Resistor 100 ohm 1/4W	1	AA
R62	VRN-B12EK272F	J	Resistor 2.7k ohm 1/4W	1	AA
R80	VRD-B12EF105J	J	Resistor 1M ohm 1/4W	1	AA
R93	VRD-B12EF152J	J	Resistor 1.5k ohm 1/4W	1	AA
R94	VRS-B13AA121J	J	Resistor 120 ohm 1W	1	AA
R96-97	VRS-B13AA101J	J	Resistor 100 ohm 1W	2	AA
RY1	RRLY-A093DRE0	J	Relay (VRB18)	1	AL
RY2	RRLY-A092DRE0	J	Relay (VRB18SP)	1	AL
RY3	RRLY-A093DRE0	J	Relay (VRB18)	1	AL
RY4	RRLY-A080DRE0	J	Relay (OJ-SH-124LM)	1	AG
RY5	RRLY-A093DRE0	J	Relay (VRB18)	1	AL
RY6-7	RRLY-A080DRE0	J	Relay (OJ-SH-124LM)	2	AG
SP30	RALM-A014DRE0	J	Buzzer (PKM22EPT-THAI)	1	AG
VRS1	RH-VZA010DRE0	J	Varistor (15G471K-T)	1	AE
ZD1	VHEHZ6A3///-1	J	Zener diode (HZ6A3)	1	AA
ZD2	VHEHZ4C3///-1	J	Zener diode (HZ4C-3)	1	AA
ZD3	VHEHZ202///-1	J	Zener diode (HZ20-2)	1	AB
3- 2	DUNTKA579WRK0	J	Key unit assembly [R-7A55(B)]	1	BB
3- 2	DUNTKA580WRK0	J	Key unit assembly [R-7A55(W)]	1	BB
3- 2	DUNTKA577WRK0	J	Key unit assembly [R-7E45(B)]	1	BB
3- 2	DUNTKA578WRK0	J	Key unit assembly [R-7E45(W)]	1	BB
3- 3	GMADIA076WRF0	U	Display window	1	AD
3- 4	HPNLCB147WRF0	U	Control panel (B)	1	AM
3- 4	HPNLCB148WRF0	U	Control panel (W)	1	AM
3- 5	JBNT-A871WRF0	U	Open button (B)	1	AD
3- 5	JBNT-A872WRF0	U	Open button (W)	1	AD
3- 6	MSPRCA045WRE0	U	Open button spring	1	AA
3- 7	XEPSD30P10XS0	J	Screw; 3mm x 10mm	5	AA
3- 8	XHPSD30P06000	J	Screw; 3mm x 6mm	1	AA

## OVEN PARTS

Δ	4- 1	DOVN-A372WRK0	U	Oven cavity	1	BP
	4- 2	LBNDKA089WRP0	U	Capacitor holder	1	AE
	4- 3	FDUC-A257WRK0	U	Exhaust duct assembly	1	AT
	4- 4	PSLDHA112WRP0	U	Heater cover R	1	AL
	4- 5	LANGQA308WRP0	U	Convection motor mounting plate	1	AE
	4- 6	NFANMA011WRP0	J	Convection fan	1	AD
	4- 7	FFANMA014WRY0	U	Auxiliary fan assembly	1	AF
	4- 8	FDUC-A261WRK0	U	Convection duct assembly	1	AP
	4- 9	PFPF-A172WRE0	U	Rear heat intercept	1	AH
	4-10	PIPFA013WRE0	U	Pipe	1	AE
	4-11	PSKR-A268WRP0	U	Conv. air angle A	1	AD
	4-12	PSKR-A269WRP0	U	Conv. air angle B	1	AD
	4-13	PSLDHA113WRP1	U	Rear heat cover	1	AH
Δ	4-14	PHOK-A078WRF2	U	Latch hook	1	AH
	4-15	FFANJA042WRK0	U	Fan blade assembly	1	AE
	4-16	PDUC-A503WRF2	U	Fan duct	1	AK
	4-17	GCOVHA312WRP0	U	Bottom heat cover	1	AH
	4-18	LANGFA155WRP4	U	Chassis support	1	AF
	4-19	LANGQA385WRP1	U	Lamp mounting angle	1	AF
	4-20	LANGQA350WRP0	U	TTM support angle	1	AC
Δ	4-21	MHNG-A324WRM0	U	Upper oven hinge	1	AD
	4-22	MLEVFA074WRF2	U	Open lever	1	AD
	4-23	PPACGA108WRE0	U	Packing	1	AC
	4-24	PFTA-A023WRP0	U	Damper	1	AE
	4-25	NCPL-A043WRF0	U	Coupling	1	AE

**Note:** The parts marked "Δ" may cause undue microwave exposure. / The parts marked "\*\*\*" are used in voltage more than 250V. / "\$" Mark: Spare parts delivery section

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
4-26	NSFTTA107WRE0	U	Damper shaft	1	AQ
4-27	PCOVPA263WRE0	U	Waveguide cover	1	AD
4-28	PSPAGA001WRE0	U	HVT cushion	1	AA
4-29	PFPF-A164WRE0	U	Heater intercept R	1	AH
4-30	PCUSUA346WRP0	U	Cushion	1	AA
4-31	PCUSUA379WRP0	U	Damper cushion	1	AC
4-32	PCUSUA380WRP0	U	Heater cushion	1	AA
4-33	PCUSUA381WRP0	U	Cushion	2	AA
4-34	PDUC-A560WRF0	U	Air intake duct B	1	AF
4-35	PDUC-A540WRF0	U	Air intake duct	1	AG
4-36	PDUC-A543WRP0	U	Air duct	1	AH
4-37	PFILWA042WRP0	U	Lamp filter	1	AB
4-38	LANGQA386WRP0	U	Thermistor angle	1	AE
4-39	MCAMPA076WRF0	U	Damper cam	1	AB
4-40	LANGTA305WRP0	U	Air separate angle	1	AF
4-41	PSKR-A279WRF0	U	Air separator angle	1	AF

### DOOR PARTS

Δ	5	CDORFA597WRK0	U	Door assembly (Brown)	1	BM
Δ	5	CDORFA598WRK0	U	Door assembly (White)	1	BM
Δ	5- 1	DDORFA659WRY0	J	Door panel assembly	1	AY
	5- 2	GCOVHA304WRF0	U	Choke cover	1	AH
	5- 3	GWAKPA296WRF0	U	Door frame (Brown)	1	AT
	5- 3	GWAKPA297WRF0	U	Door frame (White)	1	AT
Δ	5- 4	LSTPPA124WRF0	U	Latch head	1	AE
	5- 5	MSPRTA141WRE0	U	Latch spring	1	AA
	5- 6	PGLSPA388WRE0	U	Front door glass (Brown)	1	AX
	5- 6	PGLSPA389WRE0	U	Front door glass (White)	1	AX
	5- 7	XEPSD30P06000	J	Screw : 3mm x 6mm	6	AA
	5- 8	LSTPPA127WRF0	U	Glass stopper (Brown)	1	AC
	5- 8	LSTPPA128WRF0	U	Glass stopper (White)	1	AC

### MISCELLANEOUS

	6- 1	FAMI-A067WRK0	U	High rack	1	AY
	6- 2	FAMI-A075WRK0	U	Low rack	1	AY
	6- 3	FROLPA063WRK1	U	Roller stay	1	BA
	6- 4	TNTT-A059WRE0	U	Turntable tray	1	BA
	6- 5	FW-VZB278WRE0	U	Stop switch harness	1	AP
*	6- 6	QW-QZA175WRE0	U	High voltage wire A	1	AE
*	6- 7	QW-QZA176WRE0	U	High voltage wire B	1	AE
	6- 8	FW-VZB279WRE0	U	Main harness	1	BB
	6- 9	TLABSA055WRR0	U	Fuse label	1	AB
	6-10	TINS-A412WRR0	U	Operation manual for R-7A55(B)/(W)	1	AH
	6-10	TINS-A411WRR0	U	Operation manual for R-7E45(B)/(W)	1	AH
	6-12	TSPCNB921WRR0	U	Rating label	1	AH
	6-13	TCADCA500WRR0	U	Cook book	1	AQ
	6-14	TLABMA372WRR0	U	Menu label for R-7A55(W) only	1	AG
	6-14	TLABMA370WRR0	U	Menu label for R-7A55(B) only	1	AG

### SCREWS,NUTS AND WASHERS

	7- 1	XHPSD40P08K00	J	Screw : 4mm x 8mm	1	AA
	7- 2	XFPSD30P08000	U	Screw : 3mm x 8mm	1	AA
	7- 3	XWSD50-06000	J	Washer : 4mm x 0.6mm	1	AA
	7- 4	XOTSF40P12000	J	Screw : 4mm x 12mm (B)	4	AA
	7- 4	XOTSC40P12000	J	Screw : 4mm x 12mm (W)	4	AA
	7- 5	XOTSD40P10000	J	Screw : 4mm x 10mm	2	AA
	7- 6	XHTSD40P08RV0	J	Screw : 4mm x 8mm	3	AA
	7- 7	XBTUW40P06000	J	Screw : 4mm x 6mm	3	AA
	7- 8	XCBWW30P06000	J	Screw : 3mm x 6mm	6	AA
	7- 9	XNEUW40-32000	J	Nut : 4mm x 3.2mm	1	AA
	7-10	XOTWW40P06000	J	Screw : 4mm x 6mm	2	AA
	7-11	XPSSP20-20000	J	Pin	1	AA
	7-12	XWHUW40-08000	J	Washer : 4mm x 0.8mm	1	AA
	7-13	XWSUW40-10000	J	Washer : 4mm x 1.0mm	1	AA
	7-14	XBPSD40P25000	J	Screw : 4mm x 25mm	2	AA
	7-15	XNESD40-32000	J	Nut : 4mm x 3.2mm	2	AA
	7-16	LX-EZA045WRE0	U	Special screw	10	AA
	7-17	XCPSD30P06000	J	Screw : 3mm x 6mm	5	AA
	7-18	XFPSD40P08000	J	Screw : 4mm x 8mm	6	AA
	7-19	XFPSD50P10KS0	J	Screw : 5mm x 10mm	2	AC
	7-20	XOTSD40P12RV0	J	Screw : 4mm x 12mm	25	AA
	7-21	XCTWW40P06000	J	Screw : 4mm x 6mm	6	AA
	7-22	XBPSD40P05000	J	Screw : 4mm x 5mm	2	AA
	7-23	XWHS50-08000	J	Washer : 5mm x 0.8mm	1	AA

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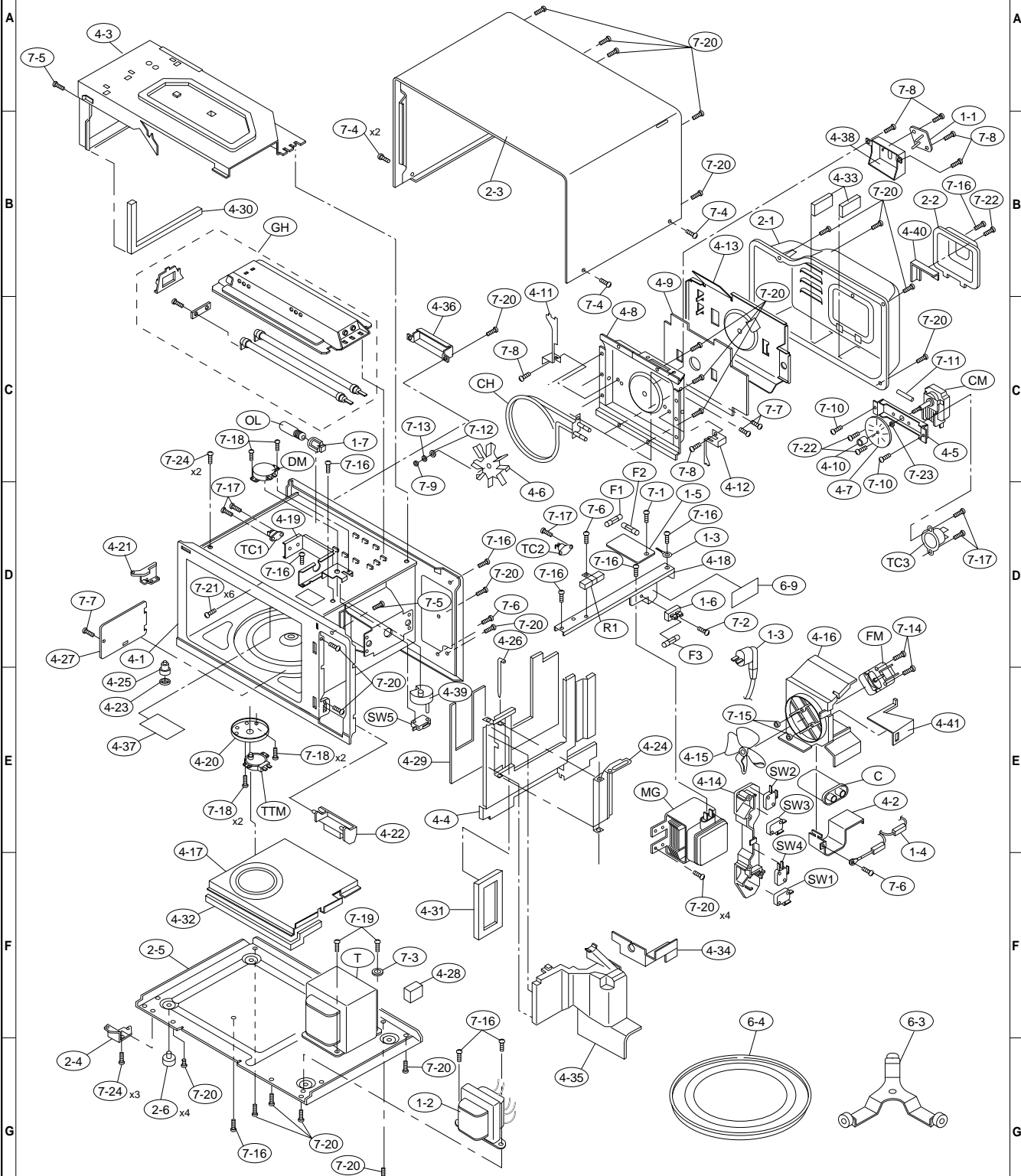
REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
7-24	LX-EZA004WRE0	U	Special screw	5	AA

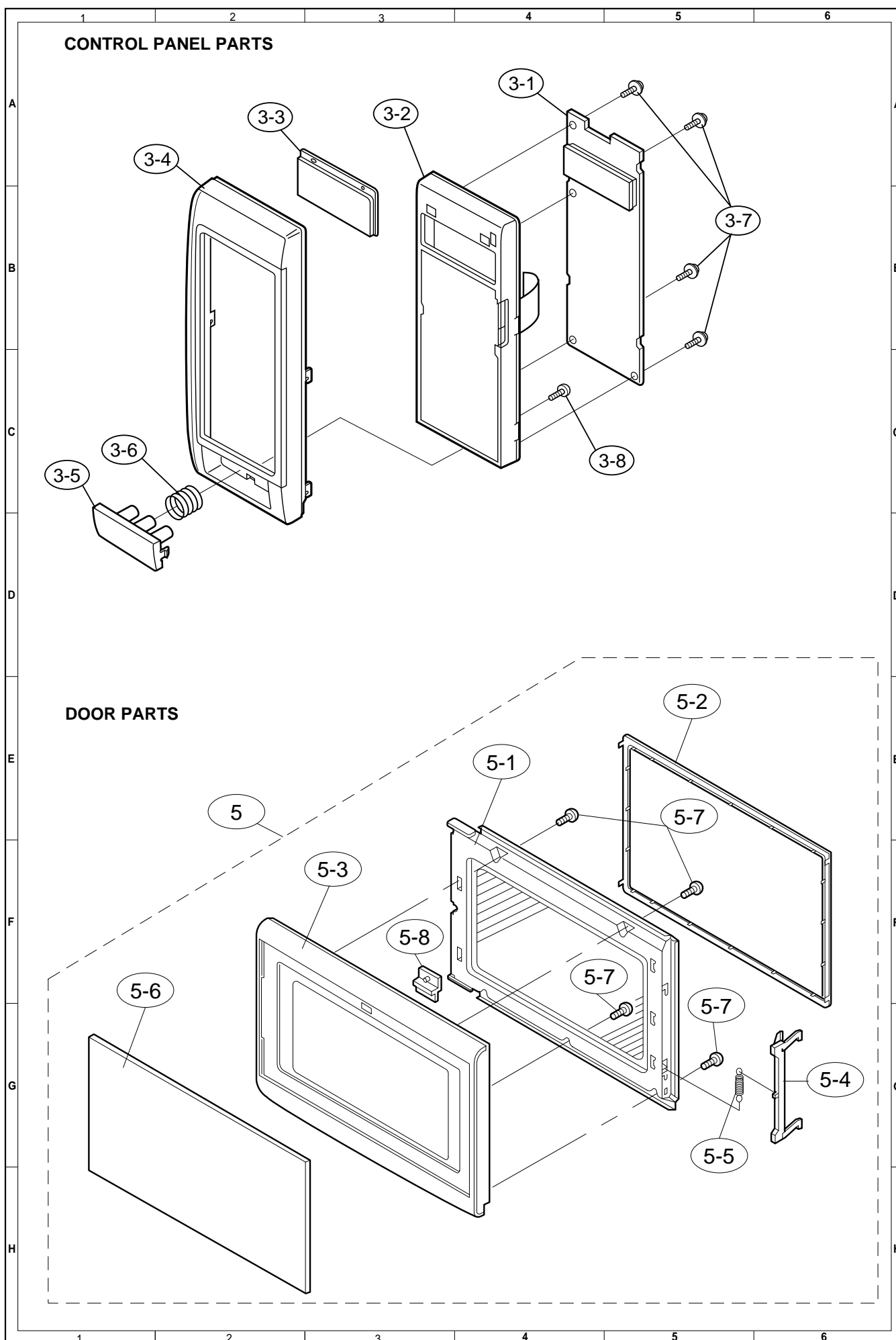
#### HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

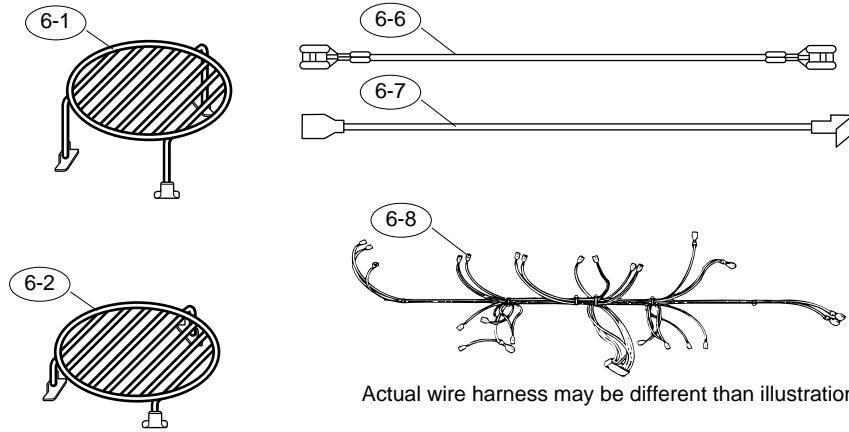
- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |

# OVEN PARTS

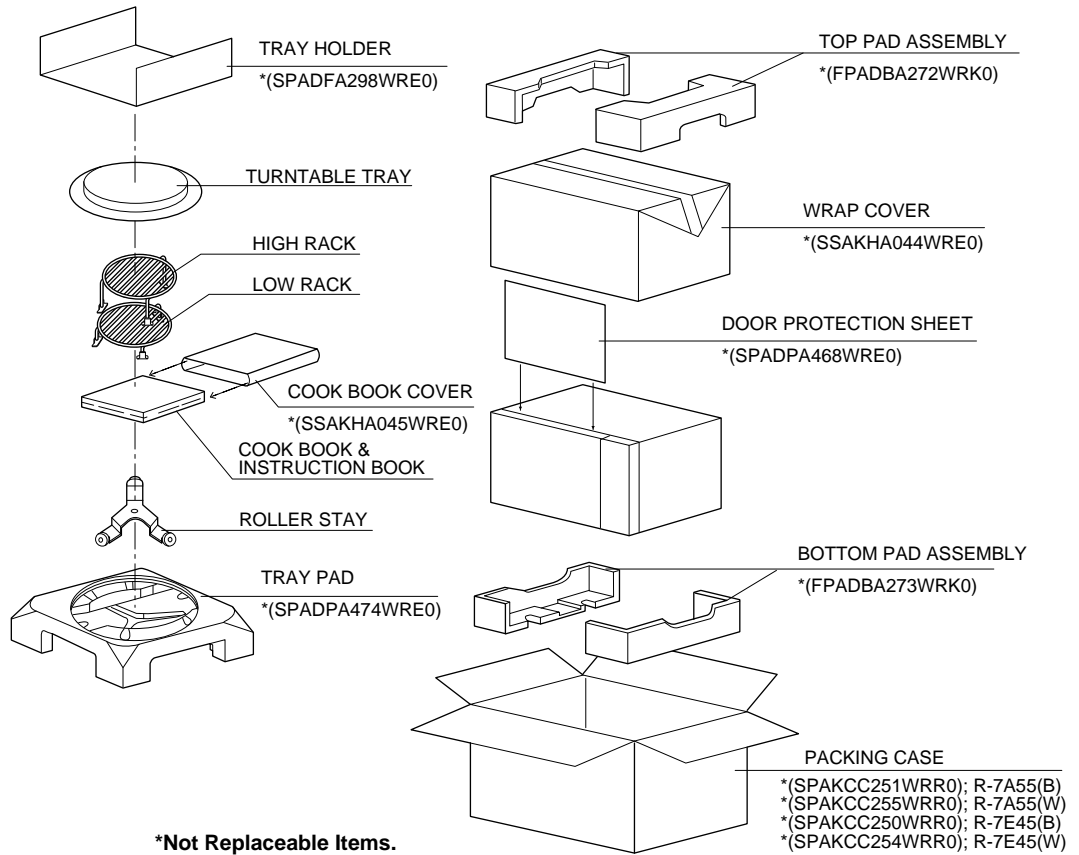




## MISCELLANEOUS



## PACKING AND ACCESSORIES



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